

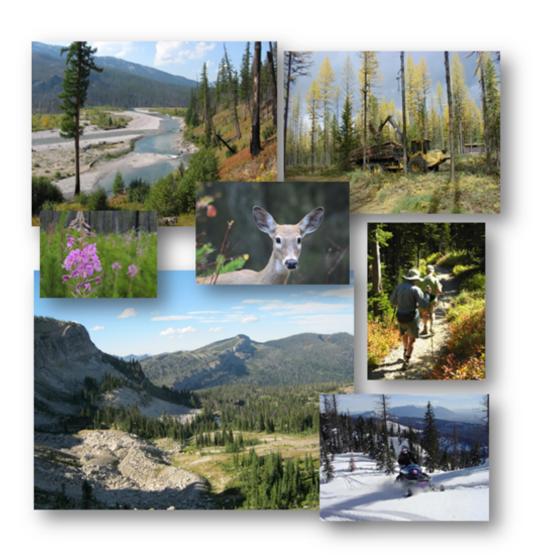
Forest Service

# **Draft Revised Forest Plan**

May 2016

# **Flathead National Forest**





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Flathead National Forest photo captions (clockwise from upper left):

- South Fork of the Flathead River, Spotted Bear Ranger District
- Forwarder working on the Paint Emery Resource Mgt. Project, Hungry Horse –Glacier View Ranger District
- Two hikers
- Snowmobile
- View taken on the way to Pentagon Cabin in the Bob Marshall Wilderness (photo by Peter Borgesen)
- Fireweed
- Whitetail deer (photo by John Littlefield)



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**Abstract:** The Flathead National Forest has developed this draft revised forest plan, in accordance with the 2012 National Forest System land management planning rule adopted by the U.S. Department of Agriculture.

# **Table of Contents**

Table of Contents	i
List of Tables	viii
List of Figures	ix
List of Abbreviations	x
Chapter 1. Introduction	1
Purpose of this Land and Resource Management Plan	1
Plan Structure	2
Plan Elements	2
Plan components	3
Management, geographic, and designated areas	
Desired conditions	
Objectives	
StandardsGuidelines	
Suitability of lands	
Other required plan content	
Summary of the use of best available scientific information	
Differences by action alternative	7
Description of key modifications to the proposed action	7
Project and Activity Consistency with the Plan	8
Determining consistency	8
Monitoring Program	9
Relationship to Other Strategic Guidance	9
Rights and Interests	9
Distinctive roles and contributions of the Flathead National Forest	9
Ecological resources	10
Social and economic resources	
Cultural and historical resources	13
Chapter 2. Proposed Forestwide Direction	15
Introduction	15
Physical and Biological	15
Aquatic Ecosystems	
Introduction	15
Watersheds (WTR)	
Desired conditions (FW-DC-WTR)	
Objectives (FW-OBJ-WTR)	
Standards (FW-STD-WTR)	
Conservation Watershed Network (CWN)	
Desired Conditions (FW-DC-CWN)	
Objectives (FW-OBJ-CWN)	
Guidelines (FW-GDL-CWN)	21

Riparian Management Zones	
Desired Conditions (FW-DC-RMZ)	
Objectives (FW-OBJ-RMZ)	
Standards (FW-STD-RMZ)	
Guidelines (FW-GDL-RMZ)	23
Soil	24
Desired conditions (FW-DC-SOIL)	
Standards (FW-STD-SOIL)	
Guidelines (FW-GDL-SOIL)	
Terrestrial Ecosystems and Vegetation (TE&V)	26
Introduction	
Desired Conditions (FW-DC-TE&V)	
General Vegetation (FW-DC-TE&V)	
Baseline carbon stocks (FW-DC-TE&V)	
Vegetation composition (FW-DC-TE&V)	27
Vegetation Structure – Forest and tree size classes (FW-DC-TE&V)	32
Vegetation Structure – Forest density (FW-DC-TE&V)	34
Vegetation Structure – Old Growth (FW-DC-TE&V)	
Vegetation Structure – Snags and downed wood (FW-DC-TE&V)	
Landscape Pattern (FW-DC-TE&V)	
Ecosystem Processes – Fire, Forest Insects and Disease (FW-DC-TE&V)	
Objectives (FW-OBJ-TE&V)	
Standards (FW-STD-TE&V)	
Guidelines (FW-GDL-TE&V)	46
Native Animal and Plant Species	49
Introduction	49
Plant species currently designated threatened, endangered, proposed and candidate (PLANT)	49
Desired Conditions (FW-DC-PLANT)	49
Objectives (FW-OBJ-PLANT)	
Standards (FW-STD-PLANT)	
Guidelines (FW-GDL-PLANT)	
Plants currently designated species of conservation concern (PLANT SCC)	
Desired Conditions (FW-DC-PLANT SCC)	
Guidelines (FW-GDL-PLANT SCC)	
Wildlife species currently designated threatened, endangered, proposed and candidate (WL)	
Desired Conditions (FW-DC-WL)	
Standards (FW-STD-WL)	
Guidelines (FW-GDL-WL)	
Wildlife currently designated as species of conservation concern (WL SCC)  Desired Conditions (FW-DC-WL SCC)	
Guidelines (FW-GDL-WL SCC)	
Objectives (FW-OBJ-WL SCC)	
Wildlife habitat diversity and associated species of interest (WL SOI)	
Introduction	
Desired conditions (FW-DC-WL SOI)	
Guidelines (FW-GDL-WL SOI)	
Objectives (FW-OBJ-WL SOI)	
Pollinator Species (POLL)	
Desired Conditions (FW-DC-POLL)	
Guidelines (FW-GDL-POLL)	
Non-Native Invasive Plants/Noxious Weeds	57

Desired Conditions (FW-DC-NNIP)	57
Objective (FW-OBJ-NNIP)	57
Guidelines (FW-GDL-NNIP)	57
Fire and Fuels Management	50
Introduction	
Desired Condition (FW-DC-FIRE)	
· · · · · · · · · · · · · · · · · · ·	
Objectives (FW-OBJ-FIRE)	
Standards (FW-STD-FIRE)	
Guidelines (FW-GDL-FIRE)	59
Air Quality	60
Introduction	60
Desired Conditions (FW-DC-AQ)	60
Standard (FW-STD-AQ)	60
Human Uses, Benefits, and Designations of the Forest	60
Recreation Setting and Access	
Introduction	
Summer Recreation (SREC)	
Introduction	
Desired Conditions (FW-DC-SREC)	
Winter Recreation (WREC)	
Introduction	
Desired Conditions (FW-DC-WREC)	_
Recreation Setting and Access—General (REC)	
Desired Conditions (FW-DC-REC)	
Objectives (FW-OBJ-REC)	
Standards (FW-STD-REC)	
Guidelines (FW-GDL-REC)	
Hunting, Trapping, Fishing, and Wildlife Viewing (REC WL)	
Scenery (SCN)	
Introduction	
Desired Conditions (FW-DC-SCN)	
Guidelines (FW-GDL-SCN)	68
Infrastructure (IFS)	
Introduction	
Desired Conditions (FW-DC-IFS)	
Objectives (FW-OBJ-IFS)	
Standards (FW-STD-IFS)	
Guidelines (FW-GDL-IFS)	72
Lands and Special Uses (LSU)	
Introduction	
Desired Conditions (FW-DC-LSU)	75
Standard	
Guideline (FW-GDL-LSU)	75
Special Designations	
Introduction	
National Scenic Trails (NST)	
Background	
Desired Conditions (FW-DC-SD NST)	
Standards (FW-STD-SD NST)	77

Guidelines (FW-GDL-SD NST)	78
Production of Natural Resources	79
Forest Vegetation Products: Timber (TIMB)	79
Introduction	79
Desired Condition (FW-DC-TIMB)	80
Objectives (FW-OBJ-TIMB)	80
Standards (FW-STD-TIMB)	80
Guidelines (FW-GDL-TIMB)	82
Other Forest Products, including Huckleberries (OFP)	82
Desired Condition (FW-DC- OFP)	82
Standards (FW-STD-OFP)	83
Guidelines (FW-DC-OFP)	83
Energy and Mineral Resources (E&M)	83
Introduction	83
Desired Condition (FW-DC-E&M)	83
Standards (FW-STD-E&M)	
Guidelines (FW-GDL-E&M)	86
Livestock Grazing (GR)	87
Desired Condition (FW-DC-GR)	
Standards (FW-STD-GR)	
Guidelines (FW-GDL-GR)	
Economic and Social (S&E)	91
Desired Condition (FW-DC-S&E)	
Partnerships and Coordination (P&C)	91
Desired Conditions (FW-DC-P&C)	91
Cultural and Historical Resources (C&HR)	92
Desired Conditions (FW-DC-C&HR)	92
Objectives (FW-OBJ-C&HR)	93
Guidelines (FW-GDL-C&HR)	93
Areas of Tribal Importance (TRIB)	93
Desired Condition (FW-DC-TRIB)	93
Objectives (FW-OBJ-TRIB)	93
Guidelines (FW-GDL-TRIB)	94
Research and Education (R&E)	94
Desired Conditions (FW-DC-R&E)	94
Chapter 3. Management Area Direction	95
Introduction	
MA 1: Wilderness	
Introduction	
1a Designated Wilderness	
Background	
Desired Conditions (MA1a-DC)	
Standards (MA1a-STD)	
Guidelines (MA1a-GDL)	
Suitability (MA1a-SUIT)	
1b Recommended Wilderness	9/

Description	97
Desired Conditions (MA1b-DC)	98
Standard (MA1b-STD)	98
Guideline (MA1b-GDL)	98
Suitability (MA1b-SUIT)	98
MA 2: Wild and Scenic Rivers	100
Introduction	
Desired Conditions (MA2-DC)	
Standards (MA2-STD)	
Guideline (MA2-GLD)	
2a Designated Wild and Scenic River	101
Description	101
Suitability (MA2a-SUIT)	101
2b Eligible Wild and Scenic Rivers	102
Desired Conditions (MA2b-DC)	103
Suitability (MA2b-SUIT)	103
MA 3: Special or Administrative Area	104
Introduction	
3a Administrative Areas	
Desired Conditions (MA3a-Admin-DC)	
Objectives (MA3a-Admin-OBJ)	106
Suitability (MA3a-Admin-SUIT)	106
3b Special Areas	106
Desired Conditions (MA3b-Special Area-DC)	108
Guidelines (MA3b-Special Area-GDL)	
Suitability in Special Areas (MA3b-Special area-SUIT)	108
MA 4: Research Natural Areas, Experimental Forest and Demonstration Forest	109
Introduction	
4a Designated Research Natural Areas	109
Description	109
Desired Conditions (MA4a-DC)	110
Suitability (MA4a-SUIT)	110
4b Experimental Forest and Demonstration Forest	111
Coram Experimental Forest	
Miller Creek Demonstration Forest	112
MA 5: Backcountry	112
Introduction	
Desired Conditions (MA5-DC)	
Suitability for MA 5 (MA5-SUIT)	
MAA C. Cananal Farest	111
MA 6: General Forest—Low	
Description	
Desired Conditions (MA6a-DC)	
Suitability (MA6a-SUIT)	
6b General Forest–Moderate	
Description	
Desired Conditions (MA6b-DC)	
Suitability (MA6b-SUIT)	
6c General Forest–High	
Description	

Desired Conditions (MA6c-DC)	116
Suitability (MA6c-SUIT)	116
MA 7: Focused Recreation Area	116
Introduction	116
Desired Conditions applicable to all MA7s (MA7-DC)	118
Summary of Suitability within Management Areas and Inventoried Roadless Areas	119
Chapter 4. Geographic Area Direction	122
Introduction	122
Hungry Horse Geographic Area	124
General Overview	124
Unique Characteristics	124
Desired Conditions (GA-HH-DC)	
Hungry Horse Management Area 7 Focused Recreation Direction	
Suitability (GA-HH-MA7-SUIT)	
Hungry Horse Reservoir (GA-HH-MA7-Reservoir)	
Hungry Horse Off-Highway Vehicle Area (GA-HH-MA7-OHV)	
Lion Lake (GA-HH-MA7-Lion)	127
Middle Fork Flathead Geographic Area	128
General Overview	128
Unique Characteristics	128
Desired Conditions (GA-MF-DC)	129
Objectives (GA-MF-OBJ)	130
Standard (GA-MF-STD)	130
Middle Fork Focused Recreation Direction: Essex Nordic Groomed Ski Area	130
North Fork Flathead Geographic Area	131
General Overview	
Unique Characteristics	
Desired Conditions (GA-NF-DC)	
Objectives (GA-NF-OBJ)	
Guidelines (GA-NF-GDL)	
Suitability (GA-NF-SUIT)	
North Fork Management Area 7 Focused Recreation Direction	134
Suitability (GA-NF-MA7-SUIT)	134
Big Mountain (GA-NF-MA7-Big Mtn)	134
Cedar Flats Off-Highway Vehicle Area	134
Big Creek Campground and Work Station	134
Alternative D: Crystal-Cedar Area	135
Alternative D: Werner-Nicola	135
Salish Mountains Geographic Area	136
General Overview	
Unique Characteristics	136
Desired Conditions (GA-SM-DC)	
Objectives (GA-SM-OBJ)	
Standards (GA-SM-STD)	
Guidelines (GA-SM-GDL)	
Salish Mountains Management Area 7 Focused Recreation Direction	
Suitability (GA-SM-MA7-SUIT)	
Big Mountain (GA-SM-MA7-Big Mtn)	139

Blacktail Mountain Nordic Ski Trail (GA-SM-MA7-BlacktailNordic)	Blacktail Mountain Ski Area (GA-SM-MA7-BlacktailSki)	140
Round Meadows Nordic Skiing (GA-SM-MA7-Round Meadows)	Blacktail Mountain Nordic Ski Trail (GA-SM-MA7-BlacktailNordic)	141
Tally Lake Campground (GA-SM-MA7-Tally Lake) Ashley Lake Campgrounds (GA-SM-MA7-Ashley Lake) Alternative D: Blacktail-Foys (GA-SM-MA7-Blacktail-Foys) Alternative D: Tally Mountain (GA-SM-MA7-Tally Mountain) Alternative D: Ingalls Mountain (GA-SM-MA7-Tally Mountain) Alternative D: Werner-Nicola  South Fork Geographic Area General Overview Unique Characteristics 12 Desired Conditions (GA-SF-DC) Dijectives (GA-SF-OBJ) Guidelines (GA-SF-GDL)  Swan Valley Geographic Area General Overview 12 Unique Characteristics 14 Swan Valley Geographic Area General Overview 15 Unique Characteristics 16 General Overview 17 Unique Characteristics 19 Desired Conditions (GA-SV-DC) 11 Swan Valley Geographic Area 19 General Overview 10 Unique Characteristics 11 Desired Conditions (GA-SV-OBJ) 11 Guidelines (GA-SV-OBJ) 12 Guidelines (GA-SV-OBJ) 13 Guidelines (GA-SV-OBJ) 14 Guidelines (GA-SV-OBJ) 15 Guidelines (GA-SV-OBJ) 16 Guidelines (GA-SV-MA7-Farause) 17 Swan Valley Management Area 7 Focused Recreation Direction 18 Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT) 19 Crane Mountain (GA-SV-MA7-Krause) 10 Holland Lake Campground (GA-SV-MA7-Holland Lake) 11 Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake) 12 Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery) 15	Blacktail Wild Bill Trail System (GA-SM-MA7-BlacktailOHV)	142
Tally Lake Campground (GA-SM-MA7-Tally Lake) Ashley Lake Campgrounds (GA-SM-MA7-Ashley Lake) Alternative D: Blacktail-Foys (GA-SM-MA7-Blacktail-Foys) Alternative D: Tally Mountain (GA-SM-MA7-Tally Mountain) Alternative D: Ingalls Mountain (GA-SM-MA7-Tally Mountain) Alternative D: Werner-Nicola  South Fork Geographic Area General Overview Unique Characteristics 12 Desired Conditions (GA-SF-DC) Dijectives (GA-SF-OBJ) Guidelines (GA-SF-GDL)  Swan Valley Geographic Area General Overview 12 Unique Characteristics 14 Swan Valley Geographic Area General Overview 15 Unique Characteristics 16 General Overview 17 Unique Characteristics 19 Desired Conditions (GA-SV-DC) 11 Swan Valley Geographic Area 19 General Overview 10 Unique Characteristics 11 Desired Conditions (GA-SV-OBJ) 11 Guidelines (GA-SV-OBJ) 12 Guidelines (GA-SV-OBJ) 13 Guidelines (GA-SV-OBJ) 14 Guidelines (GA-SV-OBJ) 15 Guidelines (GA-SV-OBJ) 16 Guidelines (GA-SV-MA7-Farause) 17 Swan Valley Management Area 7 Focused Recreation Direction 18 Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT) 19 Crane Mountain (GA-SV-MA7-Krause) 10 Holland Lake Campground (GA-SV-MA7-Holland Lake) 11 Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake) 12 Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery) 15	Round Meadows Nordic Skiing (GA-SM-MA7-Round Meadows)	142
Alternative D: Blacktail-Foys (GA-SM-MA7-Blacktail-Foys)		
Alternative D: Tally Mountain (GA-SM-MA7-Tally Mountain)	Ashley Lake Campgrounds (GA-SM-MA7-Ashley Lake)	143
Alternative D: Ingalls Mountain (GA-SM-MA7-Ingalls Mountain)	Alternative D: Blacktail-Foys (GA-SM-MA7-Blacktail-Foys)	143
Alternative D: Werner-Nicola	Alternative D: Tally Mountain (GA-SM-MA7-Tally Mountain)	144
South Fork Geographic Area	Alternative D: Ingalls Mountain (GA-SM-MA7-Ingalls Mountain)	144
General Overview	Alternative D: Werner-Nicola	144
Unique Characteristics	South Fork Geographic Area	145
Desired Conditions (GA-SF-DC)	General Overview	145
Objectives (GA-SF-OBJ)	Unique Characteristics	145
Guidelines (GA-SF-GDL)12Swan Valley Geographic Area12General Overview12Unique Characteristics14Desired Conditions (GA-SV-DC)12Objectives (GA-SV-OBJ)15Guidelines (GA-SV-GDL)15Swan Valley Management Area 7 Focused Recreation Direction15Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT)15Crane Mountain (GA-SV-MA7-Crane)15Krause Basin (GA-SV-MA7-Krause)15Holland Lake Campground (GA-SV-MA7-Holland Lake)15Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake)15Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery)15	Desired Conditions (GA-SF-DC)	146
Swan Valley Geographic Area	Objectives (GA-SF-OBJ)	147
General Overview	Guidelines (GA-SF-GDL)	147
Unique Characteristics	, , ,	
Desired Conditions (GA-SV-DC)	General Overview	148
Objectives (GA-SV-OBJ)	·	
Guidelines (GA-SV-GDL)	Desired Conditions (GA-SV-DC)	149
Swan Valley Management Area 7 Focused Recreation Direction	Objectives (GA-SV-OBJ)	150
Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT)	Guidelines (GA-SV-GDL)	150
Crane Mountain (GA-SV-MA7-Crane)	Swan Valley Management Area 7 Focused Recreation Direction	151
Krause Basin (GA-SV-MA7-Krause)	Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT)	151
Holland Lake Campground (GA-SV-MA7-Holland Lake)	Crane Mountain (GA-SV-MA7-Crane)	151
Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake)	Krause Basin (GA-SV-MA7-Krause)	152
Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery)15	Holland Lake Campground (GA-SV-MA7-Holland Lake)	152
	Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake)	153
Glossary	Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery)	153
	Glossary	154

**Appendix A: Monitoring Program** 

**Appendix B: Maps** 

**Appendix C: Potential Management Approaches and Possible Actions** 

**Appendix D: Biophysical Settings and Species Lists** 

Appendix E: Watershed Condition Framework and Priority/Watershed Conservation Network

Appendix F: Northern Rockies Lynx Management Direction Record of Decision

Appendix G: Crosswalk: List of relevant plan components for selected species, drivers, and stressors

# **List of Tables**

Table 1. Typical widths of inner and outer areas within riparian management zones (RMZs)	23
Table 2. Desired conditions forestwide for coniferous forest dominance types <sup>a</sup> (percent of Forest in the dom	inance
type)	27
Table 3. Desired conditions forestwide for coniferous tree species presence <sup>a</sup> (percent of Forest where species present)	
Table 4. Current and desired conditions by biophysical setting for tree species presence (percent of Forest w the biophysical setting where species is present)	
Table 5. Current and desired conditions forestwide for non-coniferous plant communities.	
Table 6. Current and desired conditions forestwide for coniferous forest size classes <sup>a</sup> (percent of Flathead NI land)	
Table 7. Current and desired conditions by biophysical setting for forest size class (percent of Forest within t biophysical setting in the size class)	
Table 8. Very large tree subclass definitions, current condition and desired species by biophysical setting	
Table 9. Current density (trees per acre) of very large live trees (>= 20 in. d.b.h.) across the forested lands wi each biophysical setting	ithin
Table 10. Desired and current conditions forestwide and by biophysical setting for forest density as measure canopy cover	ed by
Table 11. Current <sup>a</sup> and desired conditions for old growth forests forestwide and by biophysical setting	
Table 12. Desired range and current condition in average snags per acre of all conifer species as averaged ac	
forested acres of the Forest, forestwide and by biophysical setting and by snag diameter	
Table 13. Desired range and current conditions in average total tons per acre downed wood, as averaged acre	
forested acres within each biophysical setting on the Forest	38
Table 14. Natural range of variability (NRV) <sup>a</sup> and current condition <sup>b</sup> (acres) of early successional forest patch	
(seedling/sapling size class), forestwide (NFS lands) and by biophysical setting	
Table 15. Estimated natural range of variation (NRV) and desired conditions forestwide for recently burned f	
conditions (fire event within the preceding 10 years)	
Table 16. Snag levels to retain (where they exist) in timber harvest areas	
Table 17. Desired Conditions for Species of Conservation Concern	
Table 18. Percent of desired summer recreation opportunity spectrum (ROS) settings by alternative	
Table 19. Percent of desired winter recreation opportunity spectrum (ROS) classes	
Table 20. Desired scenic integrity objectives for the Forest	
Table 21. Attributes of priority wildlife mitigation sites based on connectivity value and projected traffic volu (Ament et al 2014).	
Table 22. Timber production suitability classification	
Table 23. Maximum opening size created by even-aged harvest in one harvest operation	82
Table 24. Management areas (MAs) by alternative	
Table 25: Designated wilderness areas on the Forest	96
Table 26. Total approximate acres of recommended wilderness areas to the National Wilderness Preservation System	
Table 27. Outstandingly remarkable values, miles, and acres of designated Wild and Scenic River (WSR)	
Table 28. Eligible wild and scenic rivers	
Table 29. Administrative sites on the Forest	
Table 30. Special areas	
Table 31. Existing research natural areas (RNAs)	
Table 32. Acres of backcountry management areas (MAs)	
Table 33. Acres of general forest management areas (MAs)	
Table 34. Focused recreation areas by alternative	
Table 35. Management areas	
Table 36. Suitability <sup>a</sup> of management areas and inventoried roadless areas (IRAs) for specific uses or activitie	
Table 37. Desired summer and winter recreation opportunity spectrum class suitability	

Table 38. Acres within the six geographic areas (GAs) on the Flathead National Forest	122
Table 39. Hungry Horse Geographic Area management area actual allocation <sup>a</sup> (acres and percent)	125
Table 40. Middle Fork Geographic Area management area allocation <sup>a</sup> (acres and percent) by alternative	
Table 41. North Fork Geographic Area management area allocation (acres and percent) by alternative	
Table 42. Salish Mountains Geographic Area management area allocation <sup>a</sup> (acres and percent) by alternative	
Table 43. South Fork Geographic Area management area allocation (acres and percent) by alternative	
Table 44. Swan Valley Geographic Area management area allocation <sup>a</sup> (acres and percent) by alternative	149
List of Figures	
Figure 1. Flathead National Forest and vicinity	10
Figure 2. The six geographic areas on the Flathead National Forest	123
The following maps are in appendix B and are located on the cd that accompanies the DEIS:	
NCDE GBCS management zones on the Flathead	B-01
Inventoried roadless areas on the Forest	B-02
Over-snow suitability by alternatives B, C, and D	-03 <b>–</b> 05
Watershed Conservation Framework Class 2 watersheds	B-06
Conservation Watershed Network	B-07
Westslope Cutthroat Genetic Purity	B-08
Riparian management zones	B-09
Biophysical setting forestwide	B-10
Biophysical settings by geographic area	·11 <b>–</b> 16
Lynx Habitat	B-17
Wildland Urban Interface	B-18
Desired Summer ROS settings (alts B, C, D)	-19–21
Desired Winter ROS settings (alts B, C, D)	22–24
Scenic integrity objectives (alts B, C, D)	-25–27
National trails	B-28
PNW Scenic Trial Corridor	B-29
Continental Scenic Divide Trail Corridor	B-30
White-tail deer habitat	B-31
Management areas by GA (alt B 32-37, alt C 38-43, alt D 44-49)	-32–49
Special Areas	-50–52
North Fork Federal Lands Withdrawal Area	B-53
Selected American Wildlands polygons for connectivity analysis	B-54
Suitability GA-NF-MA7 (Crystal-Cedar and Werner-Nicola are alt D only)	B-55
MA7 Big Mountain summer ROS and Winter ROS B-	-56–57
Bull trout occupancy climate shield	B-58
Cutthroat trout occupancy climate shield	B-59

### **List of Abbreviations**

CFR Code of Federal Regulations d.b.h. diameter at breast height

DC desired condition (forest plan component)

DCA demographic connectivity area
FW forestwide (forest plan component)

GA geographic area

GBCS Grizzly Bear Conservation Strategy
GDL Guideline (forest plan component)
GIS geographic information system

MA management area

mi mile

mmbf million board feet mmcf million cubic feet

NCDE Northern Continental Divide Ecosystem

NFS National Forest System

NRLMD Northern Rockies Lynx Management Direction

PCA primary conservation area RMZ riparian management zone

STD standard (forest plan component)

TMDL total maximum daily load

USDA United States Department of Agriculture

USFS United States Forest Service

USFWS United States Fish and Wildlife Service

# Chapter 1. Introduction

# Purpose of this Land and Resource Management Plan

The Flathead National Forest ("Forest"), see figure 1, is proposing to revise its Land and Resource Management Plan (1986, as amended; hereinafter referred to as the "1986 forest plan"). This document describes the draft revised forest plan ("draft plan"), which is the proposal for changes to the 1986 forest plan. The purpose of the draft plan is to have an integrated set of plan direction (or plan components) to provide for social, economic, and ecological sustainability and multiple uses of the Forest's lands and resources. In May of 2012, the United States Forest Service began using new planning regulations ("2012 planning rule") to guide collaborative and science-based revision of forest plans that promote the ecological integrity of national forests while considering social and economic sustainability. The 2012 planning rule specifies the following primary decisions that are to be made in forest plans:

- 1. Forestwide components to provide for integrated social, economic, and ecological sustainability, and ecosystem integrity and diversity, while providing for ecosystem services and multiple uses.

  Components must be within Forest Service authority and consistent with the inherent capability of the plan area (36 Code of Federal Regulations (CFR) 219.7 and CFR 219.8–219.10).
- 2. Recommendations to Congress (if any) for lands suitable for inclusion in the National Wilderness Preservation System and/or rivers eligible for inclusion in the National Wild and Scenic Rivers System (36 CFR 219.7(2)(v) and (vi)).
- 3. The plan area's distinctive roles and contributions within the broader landscape.
- 4. Identification or recommendation (if any) of other designated areas (36 CFR 219.7 (c)(2)(vii).
- 5. Identification of suitability of areas for the appropriate integration of resource management and uses, including lands suited and not suited for timber production (36 CFR 219.7(c)(2)(vii) and 219.11).
- 6. Identification of the maximum quantity of timber that may be removed from the plan area (36 CFR 219.7 and 219.11 (d)(6)).
- 7. Identification of geographic area or management area specific components (36 CFR 219.7 (c)(3)(d).
- 8. Identification of watersheds that are a priority for maintenance or restoration (36 CFR 219.7 (c)(3)(e)(3)(f).
- 9. Plan monitoring program (36 CFR 219.7 (c)(2)(x) and 219.12.

It is important to note that this proposed forest plan does not authorize site-specific prohibitions or activities; rather it establishes broad direction, similar to zoning in a community. Project or activity decisions will need to be made following appropriate procedures, e.g. site-specific analysis in compliance with the National Environmental Policy Act would need to be conducted, in order for prohibitions or activities to take place on the ground, which will be in compliance with the broader direction of the forest plan.

The revised forest plan will provide guidance for project and activity-level decision making on the Forest for approximately the next 15 years.

### Plan Structure

This proposed plan is designed to communicate the concepts of strategic guidance and adaptive management for the Flathead National Forest. The proposed plan is organized into several major divisions:

Chapter 1: Introduction

Chapter 2: Forestwide Direction

Chapter 3: Management Area Direction

Chapter 4: Geographic Area Direction

Index

Glossary

Appendix A—Monitoring Program

Appendix B—Maps

Appendix C—Potential Management Approaches and Possible Actions

Appendix D—Biophysical Settings and Species Lists

Appendix E—Watershed Condition Framework and Priority/Conservation Watershed Network

Appendix F—Northern Rockies Lynx Management Direction Record of Decision

Appendix G—Crosswalk (guide to locating plan components, includes drivers and stressors related plan components)

### Plan Elements

Elements of the draft forest plan are:

- Forestwide, management area, and geographic area desired conditions, objectives, standards, guidelines (chapters 2 and 3);
- The suitability of lands for specific multiple uses, including those lands suitable for timber production (chapter 3, suitability determinations by management areas);
- An estimate of the long-term sustained yield and projected timber sale quantity (chapter 2, production of natural resources);
- A description of the plan area's distinctive roles and contributions within the broader landscape (chapter 1);
- The identification of priority restoration watersheds (appendix E);
- Proposed management actions and strategies that may occur on the plan area over the life of the plan (appendix C);
- Areas proposed to be recommended to congress for inclusion in the national wilderness preservation system (chapter 3, management area 1b);

Chapter 1 2 Introduction

• The rivers identified as eligible for inclusion as part of the wild and scenic river system (chapter 3, Management Area 2b); and

• The plan monitoring program (appendix A), including any focal species.

### Plan components

Plan components guide future projects and activities and the plan monitoring program. Plan components are not commitments or final decisions approving projects or activities. Some plan components have also been designed to address drivers and stressors of ecosystems (see appendix G).

Desired conditions, objectives, standards, guidelines, suitability, and monitoring questions and monitoring indicators (see appendix A) have been given alpha-numeric identifiers for ease in referencing within the forest plan. The identifiers include:

- the level of direction (e.g., forestwide = FW, management area = MA, or geographic area = GA, note: with MA or GA direction, the MA number and the GA acronym are also included);
- the type of direction (where DC = desired condition, OBJ = objective, STD = standard, GDL = guideline, SUIT = suitability, MON=monitoring question, IND=monitoring indicator);
- the resource (for forestwide direction), e.g., WTR = watersheds and TE&V = terrestrial ecosystems and vegetation; and
- a unique number (i.e., numerical order starting with "01").

Thus, forestwide direction for desired conditions associated with watersheds would be identified starting with FW-DC-WTR-01; MA direction for desired conditions in MA-2b would be identified starting with MA-2b-DC-01, and desired conditions for the Hungry Horse GA would be identified starting with GA-HH-DC-01. The identifiers are included as part of the heading in chapters 2 through 4 with the unique number preceding each plan component.

If the component is from the Grizzly Bear Conservation Strategy (GBCS) then it will reference the Northern Continental Divide Ecosystem (NCDE) and the management zone to which it applies: primary conservation area (PCA), zone 1 and/or demographic connectivity area (DCA); e.g. within the NCDE PCA.

Following are the definitions and where necessary, a description of their context for the required plan components (36 CFR 219.7(e)).

#### Management, geographic, and designated areas

Every plan must have management areas or geographic areas, or both. The plan may identify designated or recommended designated areas as management areas or geographic areas (36 CFR 219.7(d)). These areas are assigned sets of plan components such as desired conditions, suitable uses, and in some areas either standards or guidelines, or both. Geographic area desired conditions describe what we want to achieve in specific geographic areas that are not necessarily covered by forestwide desired conditions. While all resources have been considered, the only desired conditions specified for a geographic area are those that are not adequately addressed by forestwide desired conditions.

Designated areas or features are identified and managed to maintain their unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, inventoried roadless areas, wild and scenic rivers,

wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves (36 CFR 219.19).

#### **Desired conditions**

A desired condition is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but not include completion dates (36 CFR 219.7(e)(1)(i)).

Desired conditions are not commitments or final decisions approving projects and activities. The desired condition for some resources may currently exist, or for other resources may only be achievable over a long time period.

This plan presents three types of desired conditions as follows:

- Forestwide desired conditions apply across the landscape, but may be applicable to specific areas as designated on a map.
- Management area desired conditions are indications of what future conditions would typically be
  desired. They help clarify the general suitability of various parts of the forest for different activities
  and management practices. These desired conditions help us clarify what outcomes might be expected
  in land areas with different general suitability descriptions.
- Geographic area desired conditions are specific to an area or place, such as a river basin or valley, and reflect community values and local conditions within the area. They do not substitute for or repeat forestwide desired conditions. These desired conditions allow us to focus on specific circumstances in specific geographic locations. The Forest is divided into six geographic areas (see figure 2, chapter 4).

#### **Objectives**

An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonably foreseeable budgets (36 CFR 219.7(e)(1)(ii)). Objectives describe the focus of management in the plan area within the plan period. **Objectives will occur over the life of the forest plan, considered to be over the first 15 years of plan implementation, unless otherwise specified.** Objectives can be forestwide or specific to management areas or geographic areas. Refer also to appendix C: Potential Management Approaches and Possible Actions for possible strategies to achieve certain objectives.

It is important to recognize that objectives were developed considering historic and expected budget allocations, as well as professional experience with implementing various resource programs and activities. It is possible that objectives could either exceed or not meet a target based upon a number of factors including budget and staffing increases/decreases, increased/decreased planning efficiencies, and unanticipated resource constraints.

#### **Standards**

A standard is a mandatory constraint on project and activity decision making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)). Standards can be developed for forestwide application or specific to a management area or geographic area.

Chapter 1 4 Introduction

#### **Guidelines**

A guideline is a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iv)). A guideline can be forestwide or specific to a management area or a geographic area.

#### Suitability of lands

Specific lands within the Forest are identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan identifies lands within the Forest as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands are not identified for every use or activity following guidance provided at 36 CFR 219.7 (e)(1)(v)).

The identification of suitability of lands for a use in the forest plan indicates that the use may be appropriate, but does not make a specific commitment to authorize that use. If certain lands are identified as not suitable for a use, then that use or activity may not be authorized. Prohibiting an existing or authorizing a new use requires subsequent, site-specific NEPA analysis. Generally, the lands on the Forest are suitable for uses and management activities appropriate for national forests, such as outdoor recreation, or timber, unless identified as not suitable. For suitability determinations, refer to chapters 2 and 3.

### Other required plan content

In addition to requiring that a plan have components, the 2012 planning rule requires that a plan have "other required content" (36 CFR 219.7(f)(1)) addressing priority watersheds, the distinctive roles and contributions of the plan area, a plan monitoring program, and proposed and possible actions. Distinctive roles and contributions are discussed below, the remainder of the required content can be found in appendix A: Monitoring Program, appendix C: Potential Management Approaches and Possible Actions, and appendix E: Priority Watersheds.

### Summary of the use of best available scientific information

The 2012 planning rule requires the responsible official to use the best available scientific information to inform the development of the proposed plan, including plan components, the monitoring program and plan decisions. The foundation from which the plan components were developed for the draft revised forest plan was provided by the Assessment of the Flathead National Forest, and the best available scientific information and analyses therein. From this foundation, resource specialists used the best available scientific information for development of the alternatives, and the analysis and comparison of alternatives in the DEIS. This information includes material that was readily available from public sources (libraries, research institutions, scientific journals and online literature). It also includes information obtained from other sources, such as via participation and attendance at scientific conferences; scientific knowledge from local experts; findings from ongoing research projects; workshops and collaborations; professional knowledge and experience; and information received during public participation periods. Resource specialists considered what is most accurate, reliable, and relevant in their use of the best available scientific information. The best available scientific information includes the publications listed in the literature cited sections of the Flathead's assessment and DEIS, as well as any additional information that may be used, and included, in the literature cited section of the FEIS or the planning record prior to the record of decision.

Cooperation between state and federal agencies and tribes contributed to the best available scientific information. The Forest coordinated with other national forest and regional specialists, Montana Fish,

Wildlife and Parks (MFWP), Montana Natural Heritage Program (MTNHP), and the U.S. Fish and Wildlife Service (USFWS) on lists of species known to occur on NFS lands managed by the Flathead National Forest, species habitat associations, and development of the plan revision and its alternatives. Examples of other plans that have been considered during the development of the revised forest plan include Montana's Statewide Wildlife Action Plan (MFWP 2015) as well as other state management plans (e.g., MFWP elk, wolf, bald eagle, common loon, grizzly bear (<a href="http://fwp.mt.gov/doingBusiness/reference/managementPlans/wildlifeMgmt.html">http://fwp.mt.gov/doingBusiness/reference/managementPlans/wildlifeMgmt.html</a> ); MT Department of Natural Resources and Conservation Habitat Conservation Plan for grizzly bear, Canada lynx, and riparian management areas <a href="http://dnrc.mt.gov/divisions/trust/forest-management/otter-creek-land-board">http://dnrc.mt.gov/divisions/trust/forest-management/otter-creek-land-board</a> ); and tribal plans related to wildlife management and climate change (<a href="http://nrdcsktribes.org">http://nrdcsktribes.org</a>, <a href="http://www.cskt.org/NRD/docs/CSKT%20Climate%20Change%20Adaptation%20Plan%20FINAL%200">http://www.cskt.org/NRD/docs/CSKT%20Climate%20Change%20Adaptation%20Plan%20FINAL%200</a> 9%2010%202013.pdf).

The planning principles and guidance presented in this plan are based on the Integrated Scientific Assessment for Ecosystem Management (PNW-GTR-382). The analyses developed as part of the ICBEMP and current best available science is used. The recovery plan for the coterminous United States population of bull trout (USFWS 2015a), the Columbia Headwaters Recovery Unit Implementation Plan for bull trout (USFWS 2015b), and the Region 1 Bull Trout Conservation Strategy (USFS 2013) were instrumental in developing plan components and the Conservation Watershed Network for native fish. Research from the USFS Rocky Mountain and Pacific Northwest Research Stations on climate change and native fish provided the impetus to be forward thinking.

Unpublished information provided by cooperative USFS monitoring efforts (e.g., Swan Ecosystem Center forest carnivore monitoring) was reviewed, as was information provided by interest groups with local wildlife expertise (e.g., Flathead Audubon, American Bird Conservatory). Some members of the public (including wildlife interest groups from across the nation) submitted scientific information during scoping, and this information was also reviewed. In addition, the two wildlife biologists, an aquatic specialist and a vegetation specialist on the planning team each have more than 20 years of experience working with the vegetation, wildlife and aquatic species and habitats of the northern Rocky Mountains, including the Flathead National Forest. Their local knowledge and experience of the ecosystems in the planning area contributed to the best available scientific information.

Much of the recreation and roads plan direction is derived from information from the Forest Service infrastructure database, which is called INFRA, as well as the National Visitor Use Monitoring (NVUM) surveys. The INFRA database is a collection of web-based data entry forms, reporting tools, and mapping tools that enable forests to manage and report the best available information about its inventory of constructed features (e.g., roads, trails). NVUM data is a national forest system wide monitoring survey that collects forest specific recreation use surveys every 5 years through the use of exit surveys.

Much of the information with respect to social and economic conditions and trends contained in the Assessment was taken from the Economic Profile System – Human Dimension Toolkit (EPS-HDT) developed by Headwaters Economics (EPS-HDT 2012) in partnership with the Bureau of Land Management and the U.S. Forest Service (http://headwaterseconomics.org/tools/eps-hdt). EPS-HDT uses published statistics from federal data sources, including, but not limited to, the Bureau of Economic Analysis, the Bureau of Labor Statistics, and the Census Bureau. Other significant sources of information used for developing plan direction is based upon publications on Montana's forest products industry developed by the Bureau of Business and Economic Research, Northwest Economic Development District publications, data on Forest Service programs, salary and non-salary expenditures, and employment from Forest Service corporate databases, and the results of an analysis of the contribution of

Chapter 1 6 Introduction

the Forest programs and expenditures on jobs and labor income using Forest Service corporate data and IMPLAN data for the year 2010.

### Differences by action alternative

Because a preferred alternative has not been identified, the draft plan includes management area allocation and plan components by action alternatives (B, C, and D). Management area allocation by action alternative can be viewed in the map appendix and in tables throughout this plan. The majority of plan components do not differ by alternative, except for some of the plan components pertaining to grizzly bear, recommended wilderness suitability plan components, and motorized over-snow vehicle use suitability. The inclusion of plan components that differ by alternative will be indicated by grayed-out text; e.g. alternative C.

### Description of key modifications to the proposed action

The draft forest plan reflects modifications to the proposed action (now alternative B) and associated appendices that were released for public comment with the Notice of Intent in March 2015. These modifications were made in response to comments received on the proposed action, to new information or analysis, or to refine wording of plan components and structure of the document. Some plan components are new, others were changed, for example from a guideline to a standard, and some were deleted. A summary of the more substantive modifications to the proposed action are listed below. Since numerous plan components were reworded, these changes are generally not indicated.

Following is a summary of some of the more substantive modifications to the proposed action, which is reflected in this draft forest plan:

- Aquatic Ecosystems, Watersheds and Wetlands: Substantial restructuring and reworking of plan
  components occurred in this section. Plan components associated with Wetlands, Aquatic habitat
  and Aquatic Species are now in one Watersheds section, with some components incorporated into
  other sections of the plan (such as the Native Animal and Plant Species). The Watershed Condition
  Framework was integrated into the plan components for Watersheds. Components specific to
  Conservation Watershed Network were defined.
- Riparian habitat conservation areas (RHCAs) are now called riparian management zones (RMZs): RMZ widths are defined in FW-STD-RMZ-01, replacing the definitions that were originally in the glossary and specifying an inner and outer RMZ area. Standards FW-STD-RMZ-02 and 03 replace original FW-STD-RMZ-01 and define appropriate vegetation management within RMZ areas.
- Terrestrial ecosystems and vegetation: This section has been restructured to include subheadings for easier use. There are some new plan components and some have been updated with new information (for example, for existing conditions). Some components are modified to clarify the intent or incorporate information from additional analysis. Vegetation management direction associated with the NRLMD has been largely removed and included in an appendix (see next paragraph).
- Northern Rockies Lynx Management Direction (NRLMD): The NRLMD is included as appendix F to this plan. The NRLMD plan components are being incorporated by reference throughout the draft plan, (e.g. in terrestrial ecosystems and vegetation, wildlife species, recreation, and infrastructure sections), with proposed forest-specific modifications to one guideline and addition of one exception to a standard (see FW-STD-TE&V-04 and FW-GDL-REC-05).
- Native animal and plant species: This section was previously titled "specific terrestrial native animal and plant species."

• Plant species of conservation concern: Because western white pine is not identified as a species of conservation concern, plan components associated with this species have been moved to the Terrestrial Ecosystems and Vegetation section.

- Wildlife species of conservation concern: This section was previously titled "wildlife and invertebrate species of conservation concern." Invertebrates are being addressed separately. A table was added that lists the wildlife species of conservation concern designated by the Regional Forester.
- **Non-native invasive plants/noxious weeds** is its own new section, rather than incorporated into the terrestrial vegetation section.
- **Fire and fuels management**: Section title now includes fuels management.
- Human Uses and Designations of the Forest: Substantial restructuring of this section occurred. Titles of some subsections have been reworded. There is no longer an "Ecosystem Services" section, and the components within this section have been moved to other parts of the plan, or have been pulled out into their own separate section. For example, "Baseline Carbon Stocks" is now in the Terrestrial Ecosystem and Vegetation section; Hunting, Trapping, Fishing and Wildlife Viewing is now in the Recreation Setting and Access section. A new section titled Production of Natural Resources contains the plan components associated with forest products (timber), energy and mineral resources, and livestock grazing. There are also new sections for Economic and Social, Partnerships, Cultural and Historical Resources and Areas of Tribal Importance.
- Management Area and Geographic Area Direction: The primary change that occurred in these sections is related to the Focused Recreation Areas (MA 7). Descriptions and plan components for MA 7 areas are added and placed in the Geographic Area section where they are located.

### Project and Activity Consistency with the Plan

As required by the National Forest Management Act of 1976, all projects and activities that would be authorized by the Forest Service, after the record of the decision for the revised plan, must be consistent with the forest plan (16 United States Code 1604 (i)) as described at 36 CFR 219.15 (c and d). This is accomplished by a project or activity being consistent with applicable plan components.

Resolving inconsistency: When a proposed project or activity would not be consistent with the applicable plan components, the responsible official shall take one of the following steps, subject to valid existing rights:

- Modify the proposed project or activity to make it consistent with the applicable plan components;
- Reject the proposal or terminate the project or activity;
- Amend the plan so that the project or activity will be consistent with the plan as amended; or
- Amend the plan contemporaneously with the approval of the project or activity so that the project or activity will be consistent with the plan as amended. This amendment may be limited to apply only to the project or activity.

### Determining consistency

Every project and activity authorized by the Agency must be consistent with the applicable plan components. A project or activity approval document must describe how the project or activity is consistent with applicable plan components by meeting the following criteria (36 CFR 219.15(d)):

1. **Desired conditions and objectives**. The project or activity contributes to the maintenance or attainment of one or more desired conditions, or objectives, or does not foreclose the opportunity to maintain or achieve any desired conditions, or objectives, over the long term.

- 2. **Standards**. The project or activity complies with applicable standards.
- 3. **Guidelines**. The project or activity:
  - i. Complies with applicable guidelines as set out in the plan; or
  - ii. Is designed in a way that is as effective in achieving the purpose of the applicable guidelines (§ 219.7(e)(1)(iv)).
- 4. **Suitability**. A project or activity would occur in an area:
  - i. That the plan identifies as suitable for that type of project or activity; or
  - ii. For which the plan is silent with respect to its suitability for that type of project or activity.

### **Monitoring Program**

The monitoring program is designed to test assumptions used in developing plan components and to evaluate relevant changes and management effectiveness of the plan components. Typically, monitoring questions seek additional information to increase knowledge and understanding of changing conditions, uncertainties, and risks identified in the best available scientific information as part of an adaptive management framework. BASI can identify indicators that address associated monitoring questions. The BASI is also important in the further development of the monitoring program as it may help identify protocols and specific methods for the collection and evaluation of monitoring information (from FSH 1909.12 07.11). See appendix A for the monitoring program and additional information about adaptive management.

### Relationship to Other Strategic Guidance

The Flathead National Forest contributes to the accomplishment of national strategic guidance in accordance with its own unique combination of social, economic, and ecologic conditions. This draft plan helps define the Forest's role in advancing the agency's national strategy and reflects the national goals. This draft plan is reflective of the mission of the Forest Service, which is "to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations." The draft plan also considered direction from other applicable tribal, federal, state, and county plans and strived to incorporate these organizations goals through an "all lands" integrated approach that considered the broader landscape in which the plan operates within.

## Rights and Interests

The revised forest plan will provide a strategic framework that guides future management decisions and actions. As such, the plan will not create, authorize, or execute any ground-disturbing activity. The plan will not subject anyone to civil or criminal liability and will create no legal rights. The plan will not change existing permits and authorized uses.

# Distinctive roles and contributions of the Flathead National Forest

The description of the plan area's distinctive roles and contribution within the broader landscape reflects those things that are truly unique and distinctive (36 CFR 219.2(b)). This description is important because

it is a source of motivation or reasons behind desired conditions. The following are considered when describing the plan area's distinctive roles and contributions within the broader landscape:

- Are truly unique attributes of the plan area, or are unique benefits (uses, values, products, and services) provided by the plan area to the broader landscape;
- Are important and relevant at the local, regional, and/or national level; and
- Contribute toward social, economic, and ecological sustainability.

### Ecological resources

The Forest has inherently high diversity of plant and animal life, due to its geographic location, geology, ecologically significant wetlands, topography, elevation ranges, climate conditions, and its unique patterns of historical disturbance processes, primarily wildfires of variable severities and sizes.

The Forest (see figure 1) is uniquely positioned in the heart of the Crown of the Continent Ecosystem, with a complex of wilderness and unroaded areas that border Glacier National Park and a remote portion of British Columbia. This location, among some of the largest wild areas in the lower 48 states, enhances its importance as a connector of habitats and core populations of associated wildlife. The Crown of the Continent Ecosystem harbors one of the most intact assemblages of medium to large carnivores in the contiguous United States and is inhabited by hundreds of species of native mammals, birds, fish, reptiles, amphibians and invertebrates. Carnivores inhabiting the Forest include the threatened Canada lynx as well as the grizzly bear and wolverine. The Flathead National Forest is part of Canada lynx critical habitat unit 3, Northern Rocky Mountain Region, with close to 1.8 million acres of habitat. One of the largest populations of wolverines in the lower 48 states inhabits the Forest and surrounding portions of the Crown of the Continent Ecosystem<sup>1</sup>.

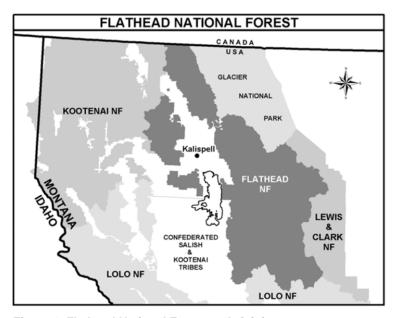


Figure 1. Flathead National Forest and vicinity

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<sup>&</sup>lt;sup>1</sup> Weaver, John L. 2013. *Safe Havens, Safe Passages for Vulnerable Fish and Wildlife, Critical Landscapes in the Southern Canadian Rockies*, British Columbia and Montana, Wildlife Conservation Society, Canada.

The Forest is part of the Northern Continental Divide Ecosystem (NCDE) for grizzly bears, one of seven grizzly bear ecosystems in the continental United States. The Flathead River in British Columbia, the North Fork of the Flathead River in Montana, as well as drainages on the east-side of the Continental Divide which are located in the northwestern portion of the Crown of the Continent Ecosystem, have the highest density of grizzly bears in inland North America. The Forest is the largest land manager within the NCDE recovery zone, managing approximately 37 percent of NCDE lands. Over 1,000 bears are estimated to be within the NCDE<sup>2</sup>.

The Flathead National Forest is noted for abundant aquatic and wetland resources. Its diverse wetlands (including fens, marshlands, glaciated ponds, woodland vernal pools, wet meadows, sloughs) and associated riparian areas provide for high water quality and key habitats for a large variety of wildlife and plant species, including the threatened plant, water howellia. In Montana, this plant is found only in the Swan Valley in Montana.

Because such a large portion of their watersheds are within protected areas, the North and Middle Forks of the Flathead River and the South Fork of the Flathead River above Hungry Horse Reservoir have abundant, intact riparian and wetland habitats and are among the least impacted riparian systems in the Flathead sub-basin.

Bull trout and westslope cutthroat trout migrate as adults from Flathead Lake to natal streams on forest to spawn. Thus Flathead Lake and the Forest are uniquely connected. Although complex food web dynamics within Flathead Lake have led to declines of these native fish, local populations on Forest have not been lost.

Flathead Lake is the largest natural freshwater lake in the western US (by surface area) outside of Alaska and it is the 79th largest of the natural freshwater lakes in the world, and is one of the cleanest. It covers 191.5 square miles (495.9 square km), has a mean depth of 165 feet, and a maximum depth of 371 feet. Flathead Lake's high water quality results from its watershed being mainly National Park, wilderness, and managed forest lands (>60%); having a relatively low human population (~95,000); being dominated by very old, low nutrient geology; receiving high amounts of precipitation (mostly as mountain snow); and rapid flushing of the Lake (about 2.2 years for all the water to be replaced) <sup>3</sup>.

Hungry Horse Reservoir is the uppermost dam within the Columbia River system and while construction of the dam in 1953 disconnected the South Fork Flathead River system from Flathead Lake for migratory fish, it now serves as a protective barrier from non-native fish. The South Fork River system and reservoir supports one of the largest intact native fish assemblages in the western United States. Upon completion of the South Fork Westslope Cutthroat Trout Conservation Project, the only non-native fish population in this watershed will consist of artic grayling in Handkerchief Lake.

The Flathead National Forest also has six research natural areas, part of a national network of ecological areas for research, education, and maintenance of biological and geological diversity. These research natural areas represent a wide range of forest types, as well as a diversity of wetlands, lakes, fens, and habitats for numerous rare plant species.

Chapter 1 11 Introduction

<sup>&</sup>lt;sup>2</sup> Montana Fish Wildlife and Parks annual reporting and Mace, R. et al. 2012. *Grizzly bear population vital rates and trend in the NCDE, The Journal of Wildlife Management*.

<sup>&</sup>lt;sup>3</sup> Flathead Lake Biological Station: http://flbs.umt.edu/lake/flatheadlake.aspx.

#### Social and economic resources

The Forest surrounds Glacier National Park on its western and southern borders. This highly scenic complex of lands draws visitors from around the world. The incredible scenery of the area contributes to community identity and sense of place, quality of life, the tourism industry, and increased real estate values.

The Forest has both developed and dispersed recreation that provide for a broad and diverse range of year round activities that range from exploring designated wilderness areas to skiing at developed ski resorts. There are two regionally significant ski areas, Whitefish Mountain Resort and Blacktail Mountain Ski Area, motorized and non-motorized travel and recreation (including mountain biking, hiking, snowmobiling, driving for pleasure), hunting, fishing, camping, Nordic and downhill skiing, white water boating, and other water and lake related opportunities.

The Forest provides abundant water for drinking and downstream uses as well as the municipal watershed, Haskill Basin, for the City of Whitefish.

The Jewel Basin Hiking Area is a unique 15,350 acre area maintained exclusively for hiking and camping, with over 20 high mountain lakes providing fishing opportunities.

The Forest contains over a million acres of designated wilderness including the Bob Marshall Wilderness, Great Bear Wilderness and Mission Mountains Wilderness. The Flathead has one designated Wild and Scenic River, the Flathead River, that has three forks—the North Fork, South Fork, and Middle Fork of the Flathead River that were designated by Congress in 1976.

Wilderness lands provide hiking, hunting, fishing, boating and horseback riding at the primitive end of the spectrum. Outfitter and guides play an important role in teaching and connecting people with the outdoors. They provide recreational experiences to visitors such as rafting, horseback riding, hunting, and camping. The Great Bear Wilderness, part of the Bob Marshall Wilderness Complex, has a functioning historic airstrip, providing fly-in recreation opportunities for small planes.

Recreating at the primitive end of the spectrum provides the user a very high probability of solitude, closeness to nature, self-reliance, high challenge and risk with little evidence of people. Solitude is commonly defined as an escape or complete isolation from all other people or situation in which you are alone usually because you want to be. Some components to solitude are remoteness, naturalness and removal from human intrusions.

Jobs in the recreation sector bring revenue into the local economy, where 20 percent of the jobs are tied to tourism-related industries. Whitefish Mountain Resort and Blacktail Mountain Ski Area contribute significantly to the local economy by creating jobs and attracting visitors. Many river-based and backcountry outfitters-guides and other recreation-based companies are dependent on the Forest for their livelihood. As the largest land jurisdiction in Flathead County, the Forest serves as the backdrop for residents and plays a key role in supporting the social and economic sustainability of local communities, the state of Montana, and the broader region.

Historically, the Flathead Valley was the center of a forest products industry that created jobs and products, which were a dominant feature of the local economy. The history of exploration, settlement, and development of the area for forest and fire management created a network of roads and trails which made recreational access to this mountainous country possible.

Although the volume of timber harvest has declined, the industry continues to be important to the local economy, providing forest products to meet local and national needs. Flathead County and adjoining

Lake, Lincoln, and Sanders Counties derive a higher percentage of their employment from timber-related industries than either the state or the nation. The Forest products industry contributes to the sense of place in the Flathead Valley.

Wildlife-related activities (hunting, fishing, wildlife viewing) are important to residents of Montana, as well as those visiting the state. The percent of Montana's population participating in wildlife-related activities was substantially higher than t the Rocky Mountain region of the west and higher than the national percentage. Hunting in northwestern Montana (Flathead, Lake, Lincoln, and Sanders Counties) is an important social and economic activity. While most of the hunting is associated with deer and elk, a large proportion of the moose hunting in the state (around one third) occurs in this four-county area.

The Forest has large quantities of huckleberries (*Vaccinium* sp.). This forest product is a key ecosystem characteristic in northwest Montana because the huckleberry fruit is highly sought-after by both humans and wildlife. Large quantities of the berries are collected in the wild and sold both locally and nationally, fresh and in products such as jams. Huckleberries remain an important food source for Native Americans, who both ate them fresh and dried them for consumption through the winter months.

#### Cultural and historical resources

Cultural features are evident across the forest, including log cabins and remnants of early Euro-American settlements, Forest Service ranger stations and fire lookouts, as well as Native American travel routes and cultural sites. The Great Northern Railway reached the Flathead Valley in 1891. With the coming of the railroad, lumber became an even more important product of the Flathead Valley. Many mills opened throughout the valley and numerous small operators set up mills on Forest lands. Evidence for the harvesting and milling still exist as heritage sites managed by the Forest. Many of the structures, trails and sites have retained their historic integrity and add to the area's character and sense of place.

The Forest has approximately 350 recorded cultural resources. Of these, the majority, approximately 275, are historic period sites associated with Flathead's Backcountry Administrative Facilities National Historic District (ranger district headquarters, guard stations, and the trails and communications systems that connect them), early 20<sup>th</sup> century Euro-American farming and mining, and historic logging. Four historic properties: Hornet Peak Lookout, the Wurtz homestead, the Stone House on Swan Lake, and Big Creek Ranger Station, are listed on the National Register of Historic Places.

The plan area is the traditional homeland of the Kootenai and Salish peoples and to a lesser extent, the Blackfeet people. The Confederated Salish and Kootenai Tribes of Montana, which includes the Kootenai, the Bitterroot Salish, and the Pend O'reille Salish peoples, have reserved treaty rights in the plan area under the Hellgate Treaty of 1855. These treaty rights include hunting, gathering, and grazing rights on Federal lands within the plan area. The Flathead Indian Reservation, which is home to the Confederated Salish and Kootenai Tribes, shares a border with the Forest on its southwestern boundary.

Approximately 75 archeological sites are associated with Native American uses of the land and include lithic scatters, travel routes, Indian scarred trees, and rock art. There are traditional travel routes and camp locations along the North Fork of the Flathead River, as well as graves and rock art sites. There is also a significant native American trail network with more than 30 associated archaeological sites in the South Fork of the Flathead area that have been determined eligible for listing on the National Register of Historic Places.

Chapter 1 13 Introduction

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Chapter 1 14 Introduction

# Chapter 2. Proposed Forestwide Direction

### Introduction

This chapter contains proposed direction that applies forestwide, unless more stringent or restrictive direction is found in chapter 3 or chapter 4. Forestwide direction includes desired conditions, objectives, standards, guidelines, and suitability. Other Forest Service direction, laws, regulations, policies, executive orders, and Forest Service directives (manual and handbook) are generally are not contained in the forest plan components.

This chapter is organized by resource, under the following broad major categories:

- Physical and Biological Elements
- Human Uses, Benefits, and Designations of the Forest
- Production of Natural Resources
- Economic and Social Environment

The Forest intends to move toward these proposed forestwide desired conditions over the next 10 to 15 years, although they may not all be achieved for many decades. Some desired conditions may be very difficult to achieve, but it is important to move toward them over time.

## **Physical and Biological**

The following sections are grouped under this heading:

- Aquatic Ecosystems
- Soil
- Terrestrial Ecosystems and Vegetation
- Native Animal and Plant Species
- Non-Native Invasive Plants/Noxious Weeds
- Fire and Fuels Management
- Air Quality

### Aquatic Ecosystems

#### Introduction

This introduction provides a brief synopsis of aquatic components on the forest and the themes used for plan component development, including native fish, aquatic habitat, riparian areas, and water quality. The Conservation Watershed Network and priority watersheds under the Watershed Condition Framework can be found in appendix E, which goes into more depth regarding strategies to protect and restore native fish and water quality. Appendix C contains a list of possible management approaches or strategies on implementation of plan components.

Lands within the Forest supply high quality water that supports a variety of uses throughout the Flathead basin. Aquatic ecosystems, watersheds, and wetlands have changed from historic conditions. Current conditions and trends indicate:

- A decline in migratory bull trout numbers during the past several decades primarily due to changes in climate and lake trout competition and predation in Flathead, Whitefish, Swan, Lindbergh, and Holland Lakes. However, bull trout remain strong in the Hungry Horse and South Fork geographic areas due to absence of lake trout.
- Major threats to bull trout and westslope cutthroat trout include the presence and expansion of nonnative species (lake trout, rainbow trout, and brook trout) and climate change. Westslope cutthroat trout populations remain strong in the three forks of the Flathead River particularly the South Fork Flathead but have declined in the Swan and Stillwater river systems.
- A small percentage of inventoried road culverts are confirmed to be partial barriers or total barriers to westslope cutthroat trout during some part of the year. In some cases, these barriers may be beneficial for retention of native fish populations by excluding non-native fish, but in many cases these barriers are disrupting the natural migration patterns of native fish.
- The Watershed Condition Framework assessment completed in 2011 determined that 97% of watersheds on the Forest are in Class 1 condition (functioning appropriately). There are 5 Class 2 (functioning at risk) watersheds (see figure B-06), which is less than 3% of all watersheds on the Forest.
- Montana Department of Environmental Quality determined that sediment continues to impair aquatic life in the following creeks on the Forest: Logan, Sheppard, Coal, Goat, and Jim Creeks. MDEQ completed sediment total maximum daily loads (TMDLs) for those waterbody segments. Therefore, TMDLs have been developed for all streams on forest where required. Four waterbodies that are below our forest boundary, Whitefish Lake (2004), Swan Lake (2004), Haskill Creek (2014) and the Stillwater River (2014) also have sediment TMDLs that have been developed. Fish Creek is a recent example of a stream that was on the 1996 303(d) list and continuing through the 2014 303(d) list for sediment impairment, but data collected by Montana Department of Environmental Quality to support TMDL development in 2014 indicated that it is no longer impaired for sediment and will be removed from the 303(d) list.

During the last several years, the Forest has been working to restore soil, watershed, and aquatic habitat conditions by implementing best management practices, removing excess roads, improving road conditions (reducing sediment), removing fish migration barriers, implementing riparian conservation strategies and threatened and endangered species conservation strategies. Much of this work has been accomplished as part of TMDL implementation plans in cooperation with the State of Montana and Environmental Protection Agency. Big Creek was the very first impaired water body in the State to be removed from the list for sediment because of restored function, however, it remains listed for habitat alteration. Lastly, sediment TMDL has been completed for Sheppard and Logan creeks in the Salish GA.

The Forest is known for its highly diverse wetlands including marshes, swamps, wet meadows, fens, peatlands, glaciated ponds, wooded vernal pools and riparian areas. T&E plant and wildlife species (including proposed, candidate, and recently delisted species), species-of-conservation-concern, and species-of-interest are associated with these and other unique habitats. The threatened plant, water howellia, is found only in the Swan Valley in Montana. For additional information about conditions and trends refer to the *Assessment of the Flathead National Forest*.

### Watersheds (WTR)

The goal of Region 1 Aquatic and Riparian Conservation Strategy ARCS is to maintain or restore watershed conditions so that conditions in managed watersheds are moving towards or are in concert with conditions in reference watersheds when considered at a National Forest Scale. The ARCS strategy replaces the Inland Fish Strategy (INFISH) and is incorporated within the plan components below and integrated throughout the plan in relevant resource sections. INFISH was designed as interim strategy for conserving native fish until the Forest Service land use plans were revised with an appropriate aquatic conservation strategy.

The plan components strengthen the building blocks of INFISH by taking into account BASI and previously overlooked gaps in current direction and add elements required in the 2012 planning rule. Changes between the 1986 plan as amended and the revised forest plan are described below.

Riparian management zones (RMZs) have increased in size for intermittent streams and wetlands and have been maintained in size on all other water bodies. Intermittent streams will have a 100 foot wide RMZ on all streams rather than 50 feet on some streams. Wetlands have a 300 foot RMZ regardless of size where previously (under INFISH), the RHCAs were 150 feet for wetlands greater than an acre in size and 50 feet for wetlands under an acre. These changes will help ensure the Forest is consistent with the Montana SMZ law for intermittent streams with slopes that are greater than 35%, which require a 100 foot wide SMZ by law, and provide for ecological functions of wetland plants and wildlife that were not covered under INFISH.

Desired conditions for RMZs have been expanded to focus on key ecological processes and functions, highlight vegetation structure and composition, and provide suitable connected wildlife habitat rather than being fish-centric under INFISH. Vegetation management within RMZs is allowed but requires a hard look and riparian and aquatic conditions must be maintained, restored or enhanced. Many activities that can cause soil compaction, vegetation disturbance or soil erosion are restricted or minimized. RMZs are not "no management zones" since treatment may be necessary to achieve desired conditions however guidance is provided for activities within RMZs. In-stream habitat conditions will be monitored by the Pacific Anadromous Fish Strategy (PACFISH) and Inland Fish Strategy (INFISH) Biological Opinion Effectiveness Monitoring Program, referred to as PIBO.

### **Desired conditions (FW-DC-WTR)**

The following desired condition apply at the larger (e.g., watershed) scale (10 or 12 digit hydrologic unit<sup>4</sup> scale), not at particular sites, e.g. stream reaches.

National Forest System lands provide the distribution, diversity, and complexity of watershed and landscape-scale features including natural disturbance regimes and the aquatic and riparian ecosystems to which species, populations, and communities are uniquely adapted. Watersheds and associated aquatic ecosystems retain their inherent resilience to respond and adjust to disturbances without long-term, adverse changes to their physical or biological integrity.

<sup>&</sup>lt;sup>4</sup> The national hydrologic unit (HU) is the basis for defining the specific scales at which the watershed desired conditions apply. The three watershed scales most relevant to implementation of the forest plan are: subbasin (8-digit HU), watershed (10-digit HU), and subwatershed (12-digit HU). Individual project assessments often use data collected at finer scales such as the subwatershed, drainage, valley segment, site, stream reach or scale. A further description of the scale(s) at which these desired conditions generally apply to forest planning and project planning are identified in appendix C.

O2 Spatial connectivity exists within or between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact habitat refugia. These network connections provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic, riparian-associated, and many upland species of plants and animals.

- Habitat and ecological conditions support self-sustaining populations of native aquatic and riparian associated plant and animal species.
- 104 Instream habitat conditions for managed watersheds move in concert with or towards those in reference watersheds. Aquatic habitats are diverse, with channel characteristics and water quality reflective of the climate, geology, and natural vegetation of the area. Stream habitat features across the forest, such as large woody material, percent pools, residual pool depth, median particle size, and percent fines are within reference ranges as defined by agency monitoring.
- **05** Aquatic systems and riparian habitats express physical integrity, including physical integrity of shorelines, banks, and bottom configurations, within their natural range of variation.
- Water quality, including groundwater, meets or exceeds applicable state water quality standards, fully supports designated beneficial uses and meets the ecological needs of native aquatic and riparian associated plant and animal species. The Forest has no documented lands or areas that are delivering water, sediment, nutrients, and/or chemical pollutants that would result in conditions that violate the State of Montana's water quality standards (e.g. TMDLs) or is permanently above natural or background levels.
- **07** The sediment regime within water bodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
- In-stream flows are sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows are retained. Stream flow regimes maintain riparian ecosystems, and natural channel and floodplain dimensions. Stream channels transport sediment and woody material over time while maintaining reference dimensions (e.g., bankfull width, depth, entrenchment ratio, slope and sinuosity).
- OP The timing, variability, and duration of floodplain inundation that is within the natural range of variation. Floodplains are accessible to water flow and sediment deposits. Over-bank floods allow floodplain development and the propagation of flood associated riparian plant and animal species.
- Groundwater dependent ecosystems, including peatlands, bogs, fens, wetlands, seeps, springs, riparian areas, groundwater-fed streams and lakes, and groundwater aquifers, persist in size and seasonal and annual timing and exhibit water table elevations within the natural range of variability. Surface and groundwater flows provide late-season stream flows, cold water temperatures, and sustain the function of surface and subsurface aquatic ecosystems.
- 11 Upland areas surrounding wetlands that have the most direct influence on wetland characteristics, as well as stream segments that flow directly into wetlands, sustain the characteristics and diversity of those wetlands. Non-forested areas in and surrounding wetlands are composed of plant and animal communities that support and contribute to wetland ecological and habitat diversity.

Habitats and native assemblages of aquatic and riparian associated plants and animals are free of persistent non-native species such as zebra mussels, New Zealand mud snails, quagga mussels, Eurasian milfoil, and brown trout. Non-native species are not expanding into water bodies (e.g., non-native bullfrogs, Chytrid fungus, yellow flag iris, or reed canary grass).

- 13 Aquatic ecosystems are resilient to the effects of climate change.
- 14 Peatlands, including fens, have the necessary soil, hydrologic, water chemistry, and vegetative conditions to provide for continued fen development and resilience to changes in climate and other stressors. Peatlands support unique plant and animal species that are characteristic of historic conditions. Trees exist on drier hummocks within and on edge of peatlands, but do not retard development.
- 15 Beavers play an important ecological role in creating and maintaining wetlands.
- 16 Watersheds produce high-quality water for downstream communities dependent upon them.
- 17 The general public has a basic understanding of wetlands, stream ecosystems, and watersheds due to educational and informational programs.
- 18 Aquatic ecosystems are free of invasive species. Non-native species are not expanding into water bodies.

### **Objectives (FW-OBJ-WTR)**

- O1 Complete all essential work identified within 5 to 10 priority watersheds as identified under the Watershed Condition Framework (see appendix E).
- 62 Enhance or restore 50 to 100 miles of stream habitat to maintain or restore structure, composition, and function of habitat for fisheries and other aquatic species. Activities include, but are not limited to, berm removal, large woody debris placement, road decommissioning or stormproofing, riparian planting, and channel reconstruction.
- Reconnect 10 to 20 miles of habitat in streams disconnected by roads or culverts where aquatic and riparian-associated species' migratory needs are limiting distribution of those species.
- 104 Improve soil and watershed conditions on 4,000 to 8,000 acres with an emphasis on priority watersheds under the Watershed Condition Framework and Conservation Watershed Network.

### Standards (FW-STD-WTR)

- New stream diversions and associated ditches shall have screens placed on them to prevent capture of fish and other aquatic organisms.
- O2 Project-specific best management practices (BMPs, including both Federal and the State of Montana BMPs) shall be incorporated in land use and project plans as a principle mechanism for controlling non-point pollution sources, to meet soil and watershed desired conditions, and to protect beneficial uses.
- Management activities shall maintain or improve water quality in public source water areas, e.g. Haskill Basin, and be consistent with applicable state source water protection requirements. Short-term effects from activities in source water areas may be acceptable when those activities support long-term benefits to aquatic resources.

O4 Portable pump set-ups shall include containment provisions for fuel spills and fuel containers shall have appropriate containment provisions. Vehicles should be parked in locations that avoid entry of spilled fuel into streams.

#### **Guidelines (FW-GDL-WTR)**

- In order to restore watersheds, sediment-producing activities in watersheds with approved total maximum daily loads (TMDLs) should be designed to comply with the TMDL implementation plan.
- To maintain stream channel stability and aquatic habitat, large woody debris should not be cut and/or removed from stream channels unless it threatens critical infrastructure, such as mid-channel bridge piers, or poses long-term risks to bull trout passage.
- O3 Cooperate with federal, Tribal, state and local governments to identify and secure instream flows needed to maintain riparian resources, channel conditions and aquatic habitat.
- O4 Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and in consistent with RMZ desired conditions.
- **05** Existing stream diversions and associated ditches should have screens placed on them as needed to prevent capture of fish and other aquatic organisms.
- When drafting water from streams, pumps should be screened to prevent capture of fish and aquatic organisms. During the spawning season for native fish, pumping sites should be located away from spawning gravels.
- When beaver dams are threatening human infrastructure or bull trout passage, preferred techniques that sustain beavers (e.g. using pipes to reduce water levels, notching dams to restore streamflow) should be used prior to using more drastic measures (e.g. removing beavers or removing their dams).
- Management activities that may disturb native salmonids, or have the potential to directly deliver sediment to their habitats, should be limited to times outside of spawning and incubation seasons for those species.
- 109 Information and preventive measures on aquatic invasive species should be included at water based recreation sites, e.g. boat ramps to inform the public.
- Equipment that comes in contact with a water body should be inspected and cleaned for aquatic invasive species prior to use in a water body or when moving between watersheds, including drafting equipment, water tenders, and helicopter buckets.
- In cooperation with appropriate agencies, invasion from aquatic invasive species, (e.g. zebra mussels, Quagga, Eurasian milfoil, Reed canary grass), into wetlands or ponds should be controlled.

### Conservation Watershed Network (CWN)

The Conservation Watershed Network is a specific subset of watersheds (10 or 12digit HUCs) where prioritization for long-term conservation and preservation of bull trout and pure westslope cutthroat trout occurs, specifically in areas with an absence of non-native competition (see figures B-07 and B-08).

Evaluation of management activities in Conservation Watershed Network will follow appropriate level of review prior to resource management.

### **Desired Conditions (FW-DC-CWN)**

Conservation Watershed Network have high quality habitat and functionally intact ecosystems that are contributing to and enhancing conservation and recovery of specific threatened or endangered fish species, or aquatic species of conservation concern, and provide high water quality and quantity. The networks contribute to short-term conservation and long-term recovery at the Recovery Unit or other appropriate population scale and to make them resilient to climate change.

#### **Objectives (FW-OBJ-CWN)**

- Onservation Watershed Network are the highest priority for restoration actions for native fish. Stormproof 15 to 30% of the roads in Conservation Watershed Network prioritized for restoration as funding allows to benefit aquatic species, e.g. bull trout. See appendix C for specific strategies for discussion of treatment options and for prioritization such as roads paralleling streams versus ridge top roads.
- Over the life of the plan, storm proofing (e.g. up-size culverts, reduce sediment on roads, realign stream constraining road segments, etc.) the transportation system will be accomplished as opportunities are identified on the following prioritized subwatersheds: Sullivan Creek, Wounded Buck Creek, Trail Creek in the North Fork, Whale Creek (includes Upper Whale, Lower Whale and Shorty creeks), Granite Creek, Bear Creek, Goat Creek and Lion Creek. Refer to appendix C for potential management approaches and possible actions.

### **Guidelines (FW-GDL-CWN)**

For subwatersheds included in the Conservation Watershed Network, net increases in stream crossings and road lengths should be avoided in RMZs unless the net increase improves ecological function in aquatic ecosystems. The net increase is measured from beginning to end of each project. Also see FW-IFS-STD-02.

### Riparian Management Zones

Riparian management zones (RMZs) are portions of watersheds where riparian-associated resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RMZs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by 1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams, 2) providing root strength for channel stability, 3) shading the stream, and 4) protecting water quality (Naiman et al. 1992<sup>5</sup>). RMZs provide other riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability. Another critical function of RMZs is to provide for wildlife habitat use and connectivity. See figure B-09 for a map of the RMZs.

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<sup>&</sup>lt;sup>5</sup> Naiman, R.J., T.J. Beechie, L.E. Benda, D.R. Berg, P.A. Bisson, L.H. MacDonald, M.D. O'Connor, P.L. Olson and E.A. Steel. 1992a. Fundamental elements of ecologically healthy watersheds in the Pacific Northwest coastal ecoregion. Pages 127-188 in R.J. Naiman, editor, Watershed Management: balancing sustainability and environmental change. Springer-Verlag, New York.

### **Desired Conditions (FW-DC-RMZ)**

01 RMZs reflect a natural composition of native flora and fauna and a distribution of physical, chemical, and biological conditions appropriate to natural disturbance regimes affecting the area. The species composition and structural diversity of native plant communities in riparian management zones, including wetlands, provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration. They will supply amounts and distributions of nutrients, coarse woody debris, and fine particulate organic matter sufficient to sustain physical complexity and stability.

- RMZs feature key riparian processes and conditions, including slope stability and associated vegetative root strength, wood delivery to streams and within the RMZs, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality, operating consistently with local disturbance regimes.
- **RMZs** have highly diverse structure and composition to support terrestrial riparian-associated plants and animals.

#### **Objectives (FW-OBJ-RMZ)**

**01** Improve 300 to 1,000 acres of riparian habitat.

#### Standards (FW-STD-RMZ)

**01** RMZs shall be delineated as follows:

Category 1 Fish-bearing streams: RMZs consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2 Permanently flowing non-fish bearing streams: RMZs consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the riparian vegetation, or to a distance equal to the height on one site-potential tree, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Category 3 Ponds, lakes, reservoirs, and wetlands: RMZs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation; or to the extent of the seasonally saturated soil; or to the distance of the height of one site-potential tree; or 300 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the mapped wetland, pond, or lake; whichever is greatest. This category includes water howellia sites and fens.

Category 4 Seasonally flowing or intermittent streams and lands identified as landslide prone: This category includes features with high variability in size and site-specific characteristics. At a minimum, the RMZ must include: (1) the intermittent stream channel and the area to the top of the inner gorge; (2) the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation; or (3) the area from the edges of the stream channel, wetland, or landslide prone terrain to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

In order to achieve watershed desired conditions, the RMZ is broken into two areas called the inner and outer RMZs. Some activities are prohibited or restricted in the inner RMZ, whereas more active management is allowed in the outer RMZ.

Table 1 outlines the typical widths of the inner, outer, and total RMZs on either side of a water body. The inner RMZ and total RMZ will extend to the top of the slope break where side slopes exceed 35%, as these areas have the highest potential for sediment delivery to water bodies.

Table 1. Typical widths of inner and outer areas within riparian management zones (RMZs).

Stream type	Inner (ft)	Outer (ft)	Total width (ft)
Category 1 – Fish bearing	150*	150	300*
Category 2 – Perennial, non fish-bearing Steep (>35% side slope)	100*	50	150*
Category 2 – Perennial, non fish-bearing Flat (<35% side slope)	75	75	150
Category 3 – Ponds, Lakes, wetlands	150	150	300
Category 4 – intermittent Steep (>35% side slope)	50*	50*	100*
Category 4 – intermittent Flat (<35% side slope)	50	50	100
Category 4 disconnected intermittent (MT State Class 3 waters)	50	50	100

<sup>\*</sup> Management zone widths extend either to the distance listed or to the top of the inner gorge slope break, whichever is greater.

- Ensure vegetation management activities proposed within RMZs are consistent with state law (e.g. Montana Streamside Management Zone Law; see appendix C).
- Vegetation management can only occur in the **inner** RMZ when necessary to maintain, restore or enhance aquatic and riparian associated resources and to meet RMZ desired conditions.
- Vegetation management can only occur in the **outer** RMZs, so long as project activities in RMZs do not result in long-term degradation to aquatic and riparian conditions.
- **05** Storage and refueling sites within RMZs must be approved by the Forest Service and have an approved spill containment plan.
- Merbicides, pesticides, and other toxicants and chemicals should only be applied within RMZs if needed to maintain, protect, or enhance aquatic and riparian resources or to restore native plan communities.

#### **Guidelines (FW-GDL-RMZ)**

- Trees should be left on site inside of RMZs (lakes and streams) to meet large wood desired conditions where it is safe and practical to do so. Trees that cannot be left on-site should be moved close by to meet instream large woody debris or riparian downed wood needs prior to being sold commercially.
- New landings, designated skid trails, staging or decking should not occur in RMZSs, unless there are no alternatives, in which case these activities should be of minimum size and be located outside the active floodplain.
- To reduce the likelihood of sediment input to streams, generally avoid new road construction, including temporary roads, in RMZs except where necessary for stream crossings.
- Aerial application of chemical retardant, foam, or other fire chemicals and petroleum should be avoided in mapped aerial retardant avoidance areas (see glossary) in order to minimize impacts to the RMZ and aquatic resources.

Temporary fire facilities (e.g. incident bases, camps, staging areas, heli-spots, retardant batch plants, and other centers) for incident activities should be located outside RMZs in order to minimize impacts. When no practical alternative exists, all appropriate measures to maintain, restore, or enhance aquatic and riparian associated resources should be used.

- **106** Locate and configure fire lines in RMZs to minimize sediment delivery and limit the creation of new stream channels.
- **07** Avoid refueling, equipment maintenance, and storage of fuels and other toxicants in RMZs, unless there are no other alternatives.
- When conducting wildland fire operations within RMZs, minimum impact suppression tactics, with a focus on minimizing heavy equipment usage, should be used to minimize impacts to RMZs.
- New sand and gravel mining and extraction should not occur within RMZs to minimize ground disturbance and sediment inputs. Exceptions may occur for trail work.
- 10 Clearcut harvest should not occur in outer RMZs to meet RMZ desired conditions.

### Soil

### **Desired conditions (FW-DC-SOIL)**

- O1 Conserve soil functions so that management activities do not impair long-term soil and site productivity.
- Oynamic soil quality is maintained when designing and implementing land management activities through the conservation and enhancement of soil physical, chemical, and biological properties. Soil physical properties resist wind and water erosion and provide sufficient substrate for plant rooting. Soil physical properties also facilitate hydrologic function by providing sufficient water storage for plants and soil organisms and adequate infiltration to accommodate high precipitation intensity and rain on snow events. Soil chemical properties relate to the conservation of sufficient site organic matter for nutrient cycling, buffered pH, and maintenance of site cation exchange capacity. Soil biological properties relate to soil organism processes in the rhizosphere.
- Areas with highly erodible soils or mass failure potential are not destabilized as a result of management activities.

#### Standards (FW-STD-SOIL)

- 01 Vegetation management activities do not create detrimental soil conditions on more than 15 percent of an activity area. In activity areas where less than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 15 percent. In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration must not exceed the conditions prior to the planned activity and must move toward a net improvement in soil quality.
- **O2** Project specific best management practices and design features shall be incorporated into land management activities as a principle mechanism for protecting soil resources.
- O3 Soil function shall be restored on temporary roads (and decommissioned road prisms used as temporary roads) when management activities that use these roads are completed. Restoration

treatments shall be based on site characteristics and methods that have been demonstrated to measurably improve soil productivity.

When decommissioning existing roads, soil function shall be restored. Restoration treatments shall be based on site characteristics and methods that have been demonstrated to measurably improve soil productivity.

### **Guidelines (FW-GDL-SOIL)**

- Of ound-based equipment for vegetation management should only operate on slopes less than 40 percent to protect soil quality. Exceptions may be considered with site specific analysis where soil, slope and equipment are determined appropriate to maintain soil functions.
- **02** To maintain soil quality and stability, ground-disturbing management activities should not occur on landslide prone areas.
- Project activities should provide sufficient effective ground cover with a post-implementation target of 85 percent to provide nutrients and reduce soil erosion.
- Project activities should conserve forest floor and coarse woody debris at expected levels for the Forest ecosystems to maintain dynamic soil quality. Management activities should either retain forest floor at half the current thickness or no less than 1 cm thick on average across activity areas. See FW-DC-TE&V-18 for target coarse woody debris levels.

# Terrestrial Ecosystems and Vegetation (TE&V)

#### Introduction

The Flathead has a wide diversity of plant communities, across sites that range from warm, moist to dry valley bottoms to cold, steep, non-forested ecosystems, supporting a rich and diverse assortment of animals. The plant communities are in a constant state of change, driven primarily by climate, vegetative succession, fire, insects, disease, invasive species, and human uses and developments. The strategy for management of the Flathead NF is to provide for the full spectrum of ecosystem biodiversity and maintain resilient forest and landscape conditions. This is essential to provide the desired ecological, social and economic services both in the short and long term.

The following sections describe the desired conditions and other plan components that collectively contribute to biodiversity across the plan area. Desired conditions are described in this section at a forestwide scale and by individual biophysical settings. Managing for desired vegetation conditions considers both the short (i.e., 10-20 years) and long (i.e., 50 years and beyond) term, recognizing that forest conditions may change gradually over long time periods or rapidly, such as with fire. Refer to appendix D for a description of biophysical settings, the acres in each biophysical setting, and lists of animal species and their habitat associations. Maps of biophysical settings forestwide (figure B-10) and by geographic area (figures B-11 to B-16) are in appendix B. Refer to appendix C for potential management approaches and possible actions that would contribute towards achieving the desired conditions and objectives described in this section.

## Desired Conditions (FW-DC-TE&V)

## General Vegetation (FW-DC-TE&V)

- Within the NCDE primary conservation area, the amount, type and distribution of vegetation provides for ecological, social and economic sustainability of NFS lands, while providing habitat components that contribute to sustaining a recovered grizzly bear population in the NCDE. See also FW-DC-WL-02.
- Within the NCDE primary conservation area, there is a mosaic of successional stages at a bear management subunit scale to provide for grizzly bear habitat needs.
- Across the landscape, diverse vegetation conditions occur, in a complex pattern of species, tree sizes, tree ages, forest densities, patch sizes, canopy layers, and other forest structural characteristics such as downed wood and snags. The vegetation mosaic across the plan area varies greatly over time as vegetation is influenced by site conditions and responds to climate changes, ecological processes (such as natural succession, fire, insects and disease), and human influences (such as vegetation management). Vegetation conditions and patterns contribute to resilient forest conditions at both the stand and landscape level, having the capacity to maintain or regain normal functioning and development following future disturbances (such as fire) or in the face of future climate changes.
- Desired habitat conditions across the forest and within each biophysical setting (refer to appendix D for description of biophysical settings) contribute to long-term persistence and diversity of plant and animal species based upon the capability of Flathead NFS land (refer to appendix D for a list of species). Ecosystem conditions contribute to the survival, reproduction, and dispersal of terrestrial and aquatic animal (vertebrate and invertebrate) species native to the Forest, and provides for nesting or denning, habitat security, shelter, and forage (also see wildlife section).

Uncommon habitat elements (e.g. rocky outcrops and cliffs, scree and talus slopes, caves, waterfalls) provide high quality habitat for associated animal (vertebrate and invertebrate) and botanical species (also see wildlife section).

Vegetation provides sustainable levels of timber harvest and other forest products, such as wood fiber, biomass, firewood, posts and poles, and medicinal plants, tepee poles, mushrooms, and berries for commercial, tribal, personal, educational and scientific uses.

#### **Baseline carbon stocks (FW-DC-TE&V)**

O7 Carbon storage and sequestration potential is sustained through maintenance or enhancement of ecosystem biodiversity and function, and managing for resilient forests adapted to natural disturbance processes and changing climates.

### Vegetation composition (FW-DC-TE&V)

The Forest supports a diversity of native tree species, with most stands composed of more than one tree species. Desired conditions for forest dominance types forest-wide are described in table 2. Desired conditions for the presence of individual tree species are described in table 3. Refer also to table 4 for desired conditions for the presence of individual tree species by each biophysical setting. Appendix C provides information on potential management approaches and possible actions to move towards achieving these desired conditions.

Table 2. Desired conditions forestwide for coniferous forest dominance types<sup>a</sup> (percent of Forest in the dominance type)

Forest dominance type	Current estimate <sup>b</sup> (%)	Desired range (%)	Desired trend from current condition
Ponderosa pine	0.4 (0-1.0)	1 - 5	Increase, with focus on sites currently dominated by Douglas-fir.
Douglas-fir	18 (16-21)	15 - 25	Trend downward on sites that support ponderosa pine and/or western larch
Western larch	5.7 (4.2-7.3)	8 - 15	Increase, with focus in areas currently dominated by lodgepole pine or Douglas-fir
Lodgepole pine	15 (12-18)	10 - 20	Trend downward in areas that support western larch or ponderosa pine
Subalpine fir/Engelmann spruce	43 (39-47)	20 - 45	Maintain near current condition in Canada lynx habitat; trend downward elsewhere
Grand fir/Western red cedar	1 (0.4-1.6)	0.5 - 2	Trend upwards in areas that would support long term development and persistence of large diameter western red cedar
Whitebark pine	2.4 (1.4-3.4)	2 - 7	Trend upward, particularly in areas best suited for species success (less competition)

a. Dominance type reflects the most common tree species in the stand.

b. Estimated mean across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: Dominance Mid 40 classes, R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

Table 3. Desired conditions forestwide for coniferous tree species presence<sup>a</sup> (percent of Forest where species is present)

Conifer species	Current estimate <sup>b</sup> (%)	Desired range (%)	Desired trend from current condition
Ponderosa pine	0.9 (0.3-1.6)	1 - 8	Increase in all size classes
Douglas-fir	35 (32-39)	30 - 45	Maintain near current condition, particularly in large/very large size classes
Western larch	18 (15-21)	20 - 30	Increase, particularly in overstory canopy layers and large/very large size classes
Lodgepole pine	26 (25-30)	15 - 30	Decrease
Subalpine fir	61 (57-65)	50 - 70	Maintain in mid and understory canopy layers in Canada lynx habitat; Decrease in overstory layers and outside lynx habitat
Engelmann spruce	44 (41-48)	25 - 50	Maintain in RMZs and/or in the mid and understory canopy layers in Canada lynx habitat; decrease elsewhere.
Grand fir	2.7 (1.6-4.0)	1 - 3	Decrease, particularly in overstory canopy layers
Western red cedar	1.3 (0.5-2.2)	0.5 - 2	Increase, particularly in overstory and large/very large size classes
Whitebark pine	11 (9-14)	10 - 15	Increase in large diameter sizes and on sites best suited for species success (low competition from other species)
Western white pine	1.6 (0.8-2.5)	3 - 10	Increase, particularly of blister rust- resistant trees

a. Presence refers to the existence of at least one live tree of the species per acre, in any size class.

b. Estimated mean across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

Presence of tree species within each coniferous forest biophysical setting meets desired conditions described in table 5. These conditions provide desired habitat conditions for associated wildlife species, and contribute to diverse and resilient forest conditions. See appendix D for a description of biophysical settings and a full list of species associated with the forest conditions within each biophysical setting. Appendix C provides information on potential management approaches and possible actions to move towards achieving these desired conditions.

Table 4. Current and desired conditions by biophysical setting for tree species presence (percent of Forest within the biophysical setting where species is present)

Biophysical setting	Current estimate <sup>a</sup> (%)	Desired range	Desired trends and conditions
Warm-Dry Coniferous Forest	Ponderosa pine: 3.8 (0.0-8.9) Douglas-fir: 73 (62-84) Western larch: 19 (11-29) Lodgepole pine: 28 (18-38)	Ponderosa pine: 15-50 Douglas-fir: 40-70 Western larch: 5-20 Lodgepole pine: 20-40	Increase presence of ponderosa pine. Decrease presence of Douglas-fir. Maintain or decrease lodgepole pine to manage at mid or low end of desired range. Maintain western larch, particularly in larger diameter size classes.  Most common species observed across the landscape is ponderosa pine, and all size classes are well represented. Pure or nearly pure stands of Douglas-fir or lodgepole pine are present but uncommon. Western larch is present on the more moist sites within this setting, most often in mixed stands with ponderosa pine and Douglas-fir. In areas determined to be white-tailed deer winter habitat mapped by MFWP, species with full crowns in winter, (e.g. Douglas-fir and ponderosa pine) are well-represented in all size classes, while western larch and to a lesser extent lodgepole pine, occur as minor or co-dominant species.
Warm-Moist Coniferous Forest	Ponderosa pine: 9.6 (0-25) Douglas-fir: 67 (48-85) Western larch: 58 (40-75) Western white pine: 5.7 (0-17.3) Lodgepole pine: 29 (10-50) Grand fir: 33 (12-54) Western red cedar: 13 (0-30) Subalpine fir: 19 (7.5-32) Engelmann spruce: 46	Ponderosa pine: 5-15 Douglas-fir: 40-70 Western larch: 55-80 Western white pine: 15-25 Lodgepole pine: 4-15 Grand fir: 15-55 Western red cedar: 15-40 Subalpine fir: 10-40 Engelmann spruce:	Maintain near current or increase presence of ponderosa pine, western larch and rust-resistant western white pine. Decrease presence of Douglas-fir and lodgepole pine. In areas mapped as habitat for Canada lynx, maintain presence of grand fir, subalpine fir and/or Engelmann spruce in mid and understory tree layers, while decreasing presence of these species in overstory canopy layers. In areas not mapped as lynx habitat (see figure B-17), and/or in portions of the wildland-urban interface (see figure B-18), decrease presence of grand fir, subalpine fir and Engelmann spruce in both understory and overstory tree layers. Western red cedar is maintained or increased, especially in areas where there is potential for development of large, old trees.  Species composition is very diverse, both across the landscape and within stands. Western larch, Douglas-fir, and ponderosa pine are the most common shade intolerant species observed, especially in overstory tree layers and larger size classes. Western white pine is present on many sites, achieving co-dominance with other shade intolerant species. Lodgepole pine is less common than other shade-intolerant species, usually present as a co-dominant or minor species. Western red cedar, grand-fir, subalpine fir and Engelmann spruce are commonly present in understory tree layers, but usually minor components of overstory tree layers, except in riparian areas, and lands immediately adjacent to streams, ponds, or wetlands, where they will be more common in all canopy layers. Groves of large, old western

Biophysical setting	Current estimate <sup>a</sup> (%)	Desired range	Desired trends and conditions
	(28-65)	20-60	red cedar are present in portions of the most sheltered sites and wet areas.  In areas determined to be white-tailed deer winter range mapped by MFWP, species with full crowns in winter, (e.g. Douglas-fir, ponderosa pine, western white pine) are well-represented in all size classes, while western larch and to lesser extent lodgepole pine, occur as co-dominant or minor species.
Cool-Moist/ Moderately-Dry Coniferous Forest	Douglas-fir: 34 (30-39) Western larch: 19 (16-23) Lodgepole pine: 31 (27-36) Subalpine fir: 67 (63-71) Engelmann spruce: 51 (47-56) Western white pine: 2.1 (1.0-3.3) Whitebark pine: 7.9 (5.7-10.3)	Douglas-fir: 35-60 Western larch: 20-40 Lodgepole pine: 15-35 Subalpine fir: 60-85 Engelmann spruce: 40-70 Western white pine: 3-6 Whitebark pine: 6-16	Increase presence of western larch, particularly the large/very large diameter trees, in overstory canopy layers, and in areas dominated by lodgepole pine. Maintain or increase presence of Douglas-fir, particularly of large/very large diameter trees, and in areas currently dominated by lodgepole pine. Increase presence of western white pine in the moist, warmer portions of this setting, and of whitebark pine on the coldest sites within this setting. Reduce lodgepole pine, maintaining it at the mid to lower end of the desired range.  Subalpine fir and/or Engelmann spruce is maintained to provide dense mid and understory canopy layers, while dominance of these species is decreased in overstory tree layers, correlated with an increased presence of western larch and Douglas-fir. These conditions contribute to conservation of Canada lynx, provide high quality habitat for cavity nesting/denning species, and promote resilient forest conditions. Pure stands of subalpine fir or Engelmann spruce are present across the landscape, but more commonly stands will contain the presence of other species, such as western larch, Douglas-fir and/or lodgepole pine. Pure or nearly pure stands of lodgepole pine are present in some areas where there have been frequent moderate or high severity wildfires.
Cold Coniferous Forest	Lodgepole pine: 7.4 (2.4-13.2) Subalpine fir: 78 (70-87) Engelmann spruce: 43 (34-53) Whitebark pine: 41 (31-51)	Lodgepole pine: 5-15 Subalpine fir: 40-75 Engelmann spruce: 20-60 Whitebark pine: 50-80	Increase presence of whitebark pine in all size classes, particularly on more exposed sites and other areas where whitebark pine has competitive advantage and is most likely to persist. In these areas, there is decreased presence of subalpine fir. On gentler slopes and basins, subalpine fir and/or Engelmann spruce is maintained in dense mid and understory tree layers, while dominance of subalpine fir is decreased in overstory tree layers, correlated with an increased presence of whitebark pine in the overstory. Presence of lodgepole pine is maintained, especially in areas where subalpine fir is the only species. Groves of alpine larch are rare but present and persistent over time on suitable sites throughout this setting.

a. Estimated mean across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

Non-coniferous vegetation types are present across the Forest and meet associated characteristics described in table 6. These communities provide habitat for associated wildlife species. Refer to appendix D for a description of the vegetation types and associated wildlife species.

Table 5. Current and desired conditions forestwide for non-coniferous plant communities.

Non-coniferous Plant Community	Current estimate <sup>a</sup> (%)	Desired range	Desired Condition
Hardwood tree communities (primarily black cottonwood, paper birch, quaking aspen)	Dominance type 1.3% (0.4-1.9)  Species Presence Cottonwood: 2.0% (1.0-2.9) Birch: 1.4% (0.7-2.3) Aspen: 0.9% (0.3-1.6)	Dominance type (persistent community) 0.5 – 2% Species presence: 4-6% where one or more of these species are present	Persistent <sup>b</sup> cottonwood communities occur in areas associated with high and/or fluctuating water tables, providing habitat for a wide variety of wildlife species. Very large black cottonwood trees are most common along large, low-gradient streams where seasonal flooding sustains a variety of age and size classes and a variety of patch sizes from less than an acre to over 100 acres, depending upon site capability. Persistent aspen or paper birch communities are rare across the Forest, but occur in areas where soil conditions tend to severely limit coniferous forest development (such as seeps). Hardwood tree communities have a high diversity of mesic forbs, shrubs, grasses, sedges, and ferns in the understory.  In coniferous forest biophysical settings, hardwood tree communities are most often transitional, comprising 40% or greater of the stand canopy cover, in a mixture with conifer species. They are most common in the warm moist biophysical settings and riparian areas. As a dominance type they occur primarily in the early successional (seedling/sapling) stage of succession after disturbances, such as fire or harvest. As these forests grow, conifer species become more dominant, but hardwood species (especially aspen and birch) are present within these stands into the midsuccessional stages (e.g., medium size class forests), providing habitat for a wide variety of wildlife species. Canopy gaps and small openings are periodically created over time within the coniferous forest landscape by disturbances, to provide sites where hardwoods continue to successfully regenerate and/or grow into larger sized trees. Refer also to desired conditions related to early successional and recently burned coniferous forest types (FW-DC-TE&V-11,12, and 24).
Grass/forb/shrub communities	Persistent communities 5% Transitional communities See estimated % for seed/sapl size class and burned forest (early successional) FW-DC-TE&V- 11,12, and 24	Persistent communities 5-7% Transitional communities See desired conditions for seed/sapl size class and burned forest (early successional) FW-DC-TE&V- 11,12, and 24	<ul> <li>Grass/forb/shrub plant communities are dispersed widely across the forest, providing habitat for a variety of wildlife species. The common types of grass/forb/shrub communities are:</li> <li>(1) Persistent<sup>b</sup> communities on mid to high elevation moist to wet sites; may be wet meadows or shrub dominated. These are maintained by avalanches, a high water table, or by harsh site conditions that slow or preclude establishment of trees.</li> <li>(2) Persistent communities on mid to low elevation relatively dry sites; may be grass dominated but may also have abundant forbs and shrubs. These are maintained by site and soil conditions that slow or preclude establishment of trees.</li> <li>(3) Transitional communities occurring within the coniferous biophysical settings during the early successional stages after disturbances, such as fire or harvest. These are by far the most common type across the Forest. Through natural succession, coniferous forest will eventually dominate, though these areas may be dominated by grass/forb/shrub communities for short or long time periods (e.g., 10 years up to many decades) depending upon the fire frequency.</li> </ul>

a. Estimated mean across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

b. For purposes of this desired condition, these plant communities are considered persistent if they remain hardwood or grass/forb/shrub dominated for 50 or more years.

#### Vegetation Structure – Forest and tree size classes (FW-DC-TE&V)

11 The Forest supports a diversity of forest size classes. Forest size class amount and distribution will fluctuate over time as forests develop through natural succession and/or change in response to disturbances. Desired conditions forestwide for forest size class proportions are described in table 6. A downward trend is desired for the small and medium tree size classes, associated with an upward trend in large, very large and seedling/sapling size classes. Refer to FW-DC-TE&V-12 for desired forest size class by each biophysical setting. Refer to FW-DC-TE&V-12 for additional desired conditions specific to the very large live tree component (trees greater than or equal to 20 inches d.b.h.). Appendix C provides information on potential management approaches and possible actions to move towards achieving desired conditions for forest size classes.

Table 6. Current and desired conditions forestwide for coniferous forest size classes<sup>a</sup> (percent of Flathead NFS land)

Forest size class	Current estimate <sup>b</sup> (%)	Desired range (%)
Seedling and sapling (<5" d.b.h.c)	14 (12-17)	10 - 40
Small tree (5-9.9" d.b.h.)	33 (30-36)	15 - 30
Medium tree (10-14.9" d.b.h.)	23 (21-26)	10 – 25
Large tree (15-19.9" d.b.h.)	10 (8.5-12)	20 – 40
Very large tree (>=20" d.b.h.)	5.8 (4.5-7.3)	3 - 20

a. Defined as the predominant diameter class of live trees. A stand within a particular forest size class may contain trees of
multiple diameters, for example some very large trees (>=20" d.b.h.) may be present within stands classified as small,
medium or large forest size class.

Desired range for forest size classes within each coniferous forest biophysical setting is described in table 8. Size classes will fluctuate over time as forests develop through natural succession and change in response to disturbances. These desired conditions, in combination with those described for composition, pattern, and other vegetation components in this plan, create habitat that supports a wide variety of wildlife associated with forests in the biophysical setting (see appendix D for a full list of species). Appendix C provides information on potential management approaches and possible actions to move towards achieving these desired conditions. Also refer to FW-DC-TE&V-18 for additional descriptions of desired conditions related to the pattern of forest size classes across the landscape.

Table 7. Current and desired conditions by biophysical setting for forest size class (percent of Forest within the biophysical setting in the size class)

Biophysical setting	Forest size class <sup>a</sup>	Current estimate b (%)	Desired range	Desired trend
Warm-Dry Coniferous Forest	Seed/Sapling Small Medium Large Very large	19 (11-28) 20 (12-29) 24 (15-32) 14 (8-21) 7.9 (3.0-14)	5-35 10-45 10-35 6-25 6-20	Maintain conditions within desired range, with increasing trend of very large size class.

b. Estimated mean across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

c. d.b.h. = diameter [at] breast height (4.5 feet above ground level)

Biophysical setting	Forest size class <sup>a</sup>	Current estimate b (%)	Desired range	Desired trend
Warm-Moist Coniferous Forest	Seed/Sapling Small Medium Large	9.6 (0-22) 38 (22-56) 31 (18-45) 11.5 (1.9-23.1)	3-40 10-45 5-25 10-40	Increasing trend of seedling/sapling, large and very large tree size classes, while decreasing small and medium tree size classes.
	Very large	7.7 (0-17)	8-40	
Cool- Moist/Moderately- Dry Coniferous Forest	Seed/Sapling Small Medium Large Very large	13 (10-15) 35 (32-39) 25 (22-28) 10 (8.2-13) 5.8 (4.1-7.5)	10-40 15-35 10-20 20-40 3-20	Increasing trend of seedling/sapling, large and very large tree size classes, while decreasing small and medium tree size classes.
Cold Coniferous Forest	Seed/Sapling Small Medium Large Very large	18 (11.5-25) 38 (29-47) 14 (8.5-21) 7.6 (2.9-13) 4.1 (1.2-7.4)	10-35 3-25 5-25 10-60 0-5	Increasing trend of large size class. Decreasing trend of small size class. Maintain seedling/sapling, medium and very large size classes near current conditions.

a. Defined as the *predominant* diameter class of live tree component. Seed/Sapling <5 in. diameter [at] breast height (d.b.h.); Small 5-9.9" d.b.h.; Medium 10-14.9 in. d.b.h.; Large 15-19.9 in. d.b.h.; Very large >=20 in. d.b.h.

13 Very large live trees (trees greater than or equal to 20 inches d.b.h.) contribute to forest structural diversity; contribute to long-term forest resilience and to forest recovery after disturbance (such as fire); contribute to the sustainability of habitat for wildlife species; provide opportunity for development of future late successional or old growth forest; are of high economic value as wood products; and provide for long-term recruitment of large rotten trees and snags, important denning habitat for lynx, fisher, and a variety of other wildlife species. Distribution, density, size and species of very large live trees are highly variable across the landscape and very dynamic over time, influenced by biophysical setting, forest dominance type, successional stage, and disturbance history. Current conditions of very large live trees across the biophysical settings are displayed in tables 9 and 10. Table 9 defines and displays the proportion of the forest within the "very large tree subclass". These areas may be present within forests of seedling/sapling, small, medium, large or very large forest size classes (as defined in tables 6 and 7). Table 10 displays the density of trees that are greater than or equal to 20 inches d.b.h. across the biophysical settings.

Desired condition is to maintain or increase the area and/or density of very large live trees across the landscape, particularly of the desired species as listed in table 10. Appendix C provides information on potential management approaches and possible actions to move towards achieving desired conditions for very large trees.

b. Estimated mean percent of area across all Flathead NFS land. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program

Table 8. Very large tree subclass definitions, current condition and desired species by biophysical setting

Biophysical setting	Very Large Tree Subclass Tree Density Criteria	Current estimate % areaª	Main desired conifer species in the very large tree size classes
Forestwide	Incorporates the criteria specific to each biophysical setting	14.1 11.9-16.5)	Desired species specific to biophysical settings below
Warm Dry biophysical setting	At least 8 trees per acre greater than or equal to 20 in. d.b.h.	18.9 (11.6-27)	Ponderosa pine
Warm Moist biophysical setting	At least 10 trees per acre greater than or equal to 20 in. d.b.h.	11.5 (2.5-22)	Western larch, ponderosa pine, western white pine, Douglas-fir, western red cedar
Cool Moist-Mod Dry biophysical setting	At least 10 trees per acre greater than or equal to 20 in. d.b.h.	14.5 (11.8-17.4)	Western larch, Douglas-fir
Cold biophysical setting	At least 10 trees per acre greater than or equal to 15 in. d.b.h.	9.2 (4.0-15.2)	Engelmann spruce, whitebark pine

a. Estimated mean percent of area across all Flathead NFS land, from summary of the "Large Tree Component" vegetation attribute, R1 Summary Data Base (Forest Service's Inventory and Analysis (FIA) program). Lower and upper bounds at 90% confidence interval

Table 9. Current density (trees per acre) of very large live trees (>= 20 in. d.b.h.) across the forested lands within each biophysical setting.

Biophysical setting	Current estimate trees per acrea
Forestwide	4.2 (3.5-5.0)
Warm Dry biophysical setting	5.4 (3.0-8.4)
Warm Moist biophysical setting	3.3 (1.0-6.4)
Cool Moist-Mod Dry biophysical setting	4.2 (3.4-5.1)
Cold biophysical setting	2.3 (0.9-3.9)

a. Estimated trees per acre across all Flathead NFS land within the biophysical setting. Lower and upper bounds at 90% confidence interval. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program. Lower and upper limit at 90% confidence level.

## Vegetation Structure – Forest density (FW-DC-TE&V)

Forest stands are at densities that contribute to the diversity and resilience of forest conditions at the stand and landscape scale. Tree density conditions contribute to ecological, social and economic desired conditions, such as those related to wildlife habitat (e.g., cover and foraging conditions for many species, including Canada lynx), forest resilience (reduced competition, increased tree vigor, development of very large trees), timber productivity (moderate densities for improved growth), and fire hazard (e.g. reduced fuels in wildland-urban interface). A wide range of tree densities will exist across the landscape, from high density, closed canopy stands at all stages of succession (seedling/sapling to very large forest size classes) to low density stands with very open canopies. Table 11 displays the desired condition for forest density.

Table 10. Desired and current conditions forestwide and by biophysical setting for forest density as measured by canopy cover.

Area	Forest density class <sup>a</sup>	Current estimate % area <sup>b</sup>	Desired trend
Forest wide	Very low to Low Moderate to High	47 (44-51) 53 (49-56)	Maintain minimum 35% of forest area in lower density category (<40% canopy cover). Decreasing trend in highest density forests (i.e., >60% canopy cover) in areas where this contributes to other desired conditions (i.e., fuel reduction, increased forest resilience, timber productivity).
Warm-Dry	Very low to Low Moderate to High	47 (36-57) 53 (43-64)	Decrease higher density forests (i.e., >60% canopy cover), and maintain a minimum 40% of area in lower densities (e.g., 10-40% canopy cover)
Warm-Moist	Very low to Low Moderate to High	29 (11-47) 71 (52-88)	Maintain minimum 50% of area at moderate and higher densities (i.e., >40% canopy cover), except in portions of the wildland-urban interface, where lower densities would be most common (e.g., 15-40%).
Cool- Moist/Mod Dry	Very low to Low Moderate to High	44 (39-48) 56 (52-60)	Maintain minimum 55% of area at moderate and higher densities (i.e., >40% canopy cover), except in portions of the wildland-urban interface, where lower densities would be more common (i.e., <40% canopy cover).
Cold	Very low to Low Moderate to High	60 (50-69) 40 (31-50)	Decrease high density forests (i.e., >60% canopy cover) to moderate and low density (i.e., <60% canopy cover).

a. Canopy cover considering trees of all size classes. Very low <15%; Low 15-40%; Moderate 41-60%; High >60%. b. Percent of NFS lands. Data source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program. Lower and upper bounds at 90% confidence level.

## **Vegetation Structure – Old Growth (FW-DC-TE&V)**

15 The desired condition is to maintain the existing proportion of old growth forest across the landscape, and promote an increasing trend in the amount and patch size of old growth forest into the future, especially in the warm dry and warm moist biophysical settings. Qualitative desired ecological conditions for old growth forest and old growth habitat are displayed in table 11.

Table 11. Current<sup>a</sup> and desired conditions for old growth forests forestwide and by biophysical setting

Biophysical setting	Desired composition, structure and other ecological conditions of old growth
General forest- wide conditions	Current estimate: 9.0% old growth (7.18-11.09).  Old growth forests persist over time as a dynamic but enduring component of the landscape. Focus is on the long term presence of old growth forest (e.g., beyond the plan period), distributed widely across the Forest. Forest-wide and within individual watersheds, the distribution, patch size and average percentage of old growth forest will be dynamic over long time periods, as stands gradually develop into old growth conditions through succession or move out of old growth conditions through natural disturbances such as fire and insect infestation.  Old growth forests at both the landscape and stand-level are resilient to impacts that might result in loss of old growth characteristics, such as insect infestation, wildfire, drought and potential climate change. Desired tree species composition and structure within old growth forest vary by biophysical settings, as described in this table.
	Patch sizes and connectivity of old growth habitat (see glossary) provide for the needs of old growth associated wildlife species (refer to appendix D for list of old growth associated wildlife species). Old growth habitat contains associated components that contribute to high quality

Biophysical setting	Desired composition, structure and other ecological conditions of old growth
	conditions for these species, such as very large snags; very large live trees with heart rot or broken tops; large diameter down woody material; and a diversity of tree size classes and canopy layers.
Warm Dry	Current estimate: 10.56% old growth forest (3.88 -18.12)  Ponderosa pine is the most common species in the large, old tree class, with western larch also common on moister sites. These two species are the dominant snags and defective live trees, with some trees attaining a large enough size to survive repeated fires. Forest canopy is relatively open, and the structure is either single canopy or small patch mosaic (patches typically less than one acre) where there are two or more tree size classes interspersed with patches of shrubs, forbs, and grasses.
Warm Moist	Current estimate: 3.85% old growth forest (3.85-10.71)  Ponderosa pine and western larch are the most common species in the large, old tree classes. These two species are the dominant snags and defective live trees, with some trees attaining a large enough size to survive repeated fires. Where supportive site conditions occur, western white pine and western red cedar are present as large, old trees, as well as in understory tree layers. Groves of very large, old western red cedar exist and amount is trending upward. Large, old Douglas-fir is widespread, most often in mixed stands with these other species. Tree density is typically moderate to high, with multiple tree sizes and canopy layers often occurring in a small-patch mosaic pattern. More open canopy conditions may also be associated with old growth, especially in areas where more frequent fire was common and fire resistant species dominate (e.g., in the Swan Valley GA).
Cool Moist- Moderately Dry	Current estimate: 8.81% old growth forest (6.60-11.25).  Western larch is the most common species in the large, old tree class, followed by Douglas-fir. These two species are the dominant snags and defective live trees, with some trees attaining a large enough size to survive repeated fires. Large, old Engelmann spruce are common in riparian areas and other sites with high soil moisture. Overall tree density is moderate to high, with wide diversity in tree sizes. Stands are composed of two or more canopy layers. Small gaps in upper canopy layers often occur, and are associated with dense patches of understory trees.
Cold	Current estimate: 10.47% old growth forest (4.35-17.46) Engelmann spruce is the most common species in the large, old tree class. Over time, large, old whitebark pine increase within old growth stands in some portions of this setting. Whitebark pine attains a large enough size to survive repeated fires. Tree density varies depending upon soil development and climatic conditions.

a. Estimated Percent of NFS lands for old growth forest (see glossary for definition), with lower and upper bounds displayed at 90% confidence level, and subplots removed due to fire. Source: R1 Summary Data Base, from data produced from the Forest Service's Inventory and Analysis (FIA) program.

## Vegetation Structure – Snags and downed wood (FW-DC-TE&V)

Snags suitable for nesting and denning, particularly in very large sizes (i.e., greater than 20 inches d.b.h.), are present not only in old growth forests, but across the matrix of forest lands, contributing to the diversity of forest structure and to the sustainability of wildlife and pollinator species associated with snags (see appendix D for a full list of species). Snag presence, distribution, density, size and species are highly variable both spatially and over time. The highest densities of snags of all sizes occur in wildfire areas that have burned with high intensity or severity, consistent with the natural range of variation. The lowest densities of snags occur in areas accessible to firewood cutting (especially close to human communities), in developed sites or other areas where the concern for human safety is elevated, and in designed fuel breaks. Lower densities and sizes of snags also tend to occur within lodgepole pine dominated stands, unless affected by mountain pine beetle infestation.

Desired conditions for snag densities across the forest are displayed in table 12. Ranges are displayed as an average across all forested acres (excluding the lodgepole pine dominance type) forestwide and within each biophysical setting. Individual stands or sites may have no snags in these size categories, or a much higher number of snags per acre, depending upon the unique conditions and disturbance history.

Table 12. Desired range and current condition in average snags per acre of all conifer species as averaged across *all forested acres* of the Forest, forestwide and by biophysical setting and by snag diameter

Biophysical setting	Current estimate <sup>a</sup> (>15 in. d.b.h.)	Current estimate (>20 in. d.b.h.)	Desired range in average number of snags per acre greater than or equal to 15 in. d.b.h.	Desired range in average number of snags per acre greater than or equal to 20 in. d.b.h.
Forestwide	4.5	1.6	3.7 – 5.4	1.4 – 2.1
Warm-Dry	2.8	1.1	1.0 – 5.0	0.2 – 2.3
Warm-Moist	4.6	1.8	1.0 – 8.8	0.5 – 4.0
Cool- Moist/Mod. Dry	4.3	1.5	3.4 – 5.4	0.8 – 2.1
Cold	6.0	1.6	3.5 – 8.8	0.6 - 2.8

a. Data source: R1 Summary Data Base, from the Forest Service's Inventory and Analysis (FIA) program.

- Snags or decaying and broken-topped live trees greater than 20 inches d.b.h. are present, predominately ponderosa pine or western larch (which have the greatest longevity as snags), and provide habitat for primary cavity nesters (a variety of woodpecker species), secondary cavitynesters (such as flammulated owls) and mammals (such as marten and fisher). These and other snags greater than 15 inches d.b.h. are also available for boreal owls, chickadees, bluebirds and numerous other species associated with tree cavities (see appendix D for a full list of species).
- Downed wood, especially the larger material (e.g., 9 inches or larger in diameter), is present across the matrix of forested lands, contributing to forest structural diversity, soil ecological function, and habitat for wildlife species associated with down wood for feeding, denning and cover (such as marten and fisher-- see appendix D for a full list of species). Downed wood is highly variable in amount, sizes, species and stages of decay, both across the landscape and over time.

The desired condition for downed wood is displayed in table 13. The desired range is expressed as a forestwide average across all forested acres within each biophysical setting. Specific stands or sites may have much lower or higher amounts of downed wood per acre, depending upon the unique conditions, site-specific management objectives, and disturbance history. Lowest amounts of downed wood (e.g. less than 10 tons per acre) are found in areas where concern for fire hazard is elevated, such as adjacent to human structures, in designed fuel breaks, and in areas accessible to firewood cutting. Highest amounts are generally found in the areas with lower direct human influence, such as wilderness or unroaded areas, and in areas that burned in the recent past or have had recent insect/disease infestations.

Table 13. Desired range and current conditions in average total tons per acre downed wood, as averaged across <u>all forested acres</u> within each biophysical setting on the Forest

Biophysical setting	Current estimate <sup>a</sup> (total tons per acre)	Desired Range in average total tons per acre of downed woody material
Warm Dry	18.6	10–26
Warm Moist	19.2	8–25
Cool Moist-Moderately Dry	18.6	16–21
Cold	12	9-16

a. Data source: R1 Summary Data Base, from the Forest Service's Inventory and Analysis (FIA) program.

### Landscape Pattern (FW-DC-TE&V)

19 Forest patches (areas that have similar forest attributes, such as tree age or size class) form a landscape pattern consistent with the natural range of variability and contributing to the resilience of the forest at the stand and landscape scale. Forest patterns contribute to connectivity of habitat for wildlife (e.g. Canada lynx, marten), movement within and between home ranges, and dispersal between populations. Early successional seedling/sapling-dominated forest patches are a key feature affecting landscape patterns and connectivity of habitat, because their distinctive vegetation condition contrasts sharply with adjacent forests, and create openings within the heavily forested landscape of the Flathead. Table 15 displays the current condition and estimated NRV for average patch size of early successional forest, forest-wide and by biophysical setting.

Table 14. Natural range of variability (NRV)<sup>a</sup> and current condition<sup>b</sup> (acres) of early successional forest patches (seedling/sapling size class), forestwide (NFS lands) and by biophysical setting

Setting	NRV Arithmetic average patch size	NRV Range of arithmetic average patch size	NRV Weighted average <sup>c</sup> patch size	CURRENT Arithmetic Average patch size	CURRENT Largest patch size
Forest wide	288	171-442	37,700 (max. 68,900)	108	41,800
Warm Dry biophysical setting	102	84-134	15,900 (max. 41,700)	57	5,500
Warm Moist biophysical setting	103	74-128	4,100 (max. 7,000)	28	360
Cool Moist-Mod Dry biophysical setting	188	133-247	16,900 (max. 27,100)	185	41,800
Cold biophysical setting	83	70-102	960 (max. 1,500)	72	3,000

a. Source: Modeling of stand replacement fire disturbances (SIMPPLLE model) over time, with early successional forest defined as forest conditions up to 20 years after the fire event. Values are global averages (average of the averages). All land ownerships included in the NRV analysis.

Desired conditions related to forest patterns across the landscape and within biophysical settings are described below.

**Forestwide**: The forestwide pattern of forest patches is consistent with the spatial and temporal arrangement that would occur under the natural fire regimes within this ecosystem (refer also to

b. Source: FNF GIS and activity data base (FACTS) for recent (within 25 years) regeneration harvests and stand replacement fire. Analysis set a minimum patch size of 5 acres.

c. Weighted by size of patch, thus larger patches have greater influence on the average value.

FW-TE&V-DC-16). Forest patches across the landscape vary widely in size, shape and conditions (such as tree density and number of canopy layers). The patch sizes of early successional seedling/sapling forest openings are highly variable. They are dispersed widely and interspersed among patches of small, medium and large forest size classes. The majority of seedling/sapling patches are less than 300 acres in size, but very large patches (e.g., those greater than 30,000 acres) may exist on the Forest, though less commonly (i.e. they may exist for one 20 year period over an 100 year time span). The largest patch sizes occur predominantly within wilderness and large unroaded areas, and smaller patch sizes (e.g. less than 300 acres) occur outside these areas.

Warm-Dry coniferous biophysical setting: Forests on this setting reflect the variation that might occur in a mixed severity fire regime where low to moderate severity burn conditions are most common. High severity fires may have occurred periodically, but are infrequent, generally smaller in size than on cool moist settings, and large diameter trees that have survived the fire occur within the fire area (e.g., ponderosa pine and western larch). Forest patches of different sizes, shapes, and forest conditions form a complex and diverse pattern, resulting from both active vegetation management (e.g. timber harvest and prescribed fire) and natural processes, such as succession. Across the landscape, early successional patches are interspersed with similarly sized patches dominated by medium and larger sized trees, often with relatively open mid-story canopies. Small grass, forb or shrub-dominated vegetation types occur within this matrix where gaps in the forest canopy or a very open canopy forest are present. The larger early successional seedling/sapling dominated patches (e.g., several hundred acres in size) generally occur in wilderness and large unroaded areas. Smaller clumps or patches (e.g., 5 to 180 acres in size) of seedling/sapling dominated forest are more common, particularly outside these unroaded areas. Though some early successional patches are even aged, most are two-aged or multi-aged, where overstory trees are present as scattered individuals, small groups or patches. This diverse forest structure persists as the seedling/sapling trees grow into the small, medium and large forest size classes.

Forests in the warm-dry biophysical setting provide habitat for a variety of wildlife species (see appendix D for a full list of species). Flammulated owls have a mosaic of snags for nesting, dense patches of small Douglas-fir for roosting, and openings for feeding. The mosaic pattern of forest conditions, consisting of patches of large, full-crowned trees that reduce snow depths interspersed with patches of dense young trees that provide food and shelter from the wind, provide winter habitat for white-tailed deer and other big game species over long time frames as climate, forest and landscape conditions change. Processes (e.g. fire, wind, insects and disease) that create diverse patches and patch sizes also create forest groundcover consisting of a variety of grasses, forb, and shrub species that provide wildlife forage and nesting sites. Wildlife species are able to move between patches of foraging habitat or between foraging and denning or nesting habitat.

Warm-Moist coniferous biophysical setting: Forest patterns across the area generally reflect the variation that might occur in a mixed severity fire regime, where low and moderate severity burned conditions are common. High severity fires may have occurred periodically, but are infrequent, generally smaller in size than on cool moist settings, and large diameter trees that have survived the fire occur within the fire area (e.g., western larch, ponderosa pine, Douglas-fir and western white pine). Forest form a complex, diverse pattern of conditions across the landscape, and result primarily from active vegetation management (including timber harvest and limited use of fire) and from natural forest succession. Early successional seedling/sapling forests are interspersed across the landscape with similarly sized forest patches dominated by small, medium and larger tree sizes. Early successional seedling/sapling dominated patches may be large (e.g., 250 acres or more) but more often occur as smaller patches (e.g. 20 to 200 acres in size). Within these patches there are usually live, fire tolerant overstory trees present, from small to large size trees, as scattered

individuals, small groups or patches. Over time stands will often develop multiple canopy layers, with shade tolerant species (e.g., grand fir, western red cedar, subalpine fir) occupying the understory layers and larger sized, usually fire tolerant species dominating the overstory layers. The species, density, and size of overstory tree species vary widely, depending on factors such as site capability, stand history, and successional development.

Forests in the warm-moist biophysical setting provide habitat for a variety of wildlife species (see appendix D for a full list of species). Flammulated owls have a mosaic of snags for nesting, dense patches of small Douglas-fir for roosting, and openings for feeding. The mosaic pattern of forest conditions, consisting of dense mature trees that reduce snow depths, interspersed with patches of dense young trees, that provide food and shelter from the wind, provide winter habitat for white-tailed deer and other big game species over long time frames as climate, forest and landscape conditions change. Processes (e.g. fire, wind, insects and disease) that create diverse patches and patch sizes also create forest groundcover consisting of windblown lichens and a variety of grasses, forb, and shrub species. With the exception of the ponderosa pine dominance type, patches of very large old cedar, hemlock, or western larch with heartrot provide denning and resting habitat for fisher in a landscape mosaic of mature and young forest.

In Canada lynx habitat and critical habitat (map B-14) a mosaic of successional stages promotes the value of critical habitat for the conservation of the Canada lynx. Except in portions of the wildland-urban interface, young forests with high horizontal cover of abundant tall shrubs/dense saplings are interspersed with older forests, to provide food and cover for snowshoe hares (the primary prey of Canada lynx).

Other than in areas of recent stand-replacing wildfire, patches of shrubs and coniferous trees in the small to large size classes (>5 inches average d.b.h.) are interconnected, allowing animals such as lynx and marten to move within and between home ranges. The width and distribution of patches are highly variable due to environmental conditions which change over time (e.g. disturbance, forest succession), so their location changes over time.

Cool-Moist/Moderately Dry coniferous biophysical setting: Forest patterns generally reflect the natural variation that might occur where moderate and high severity fire are prevalent, though very large high severity fires are relatively infrequent. Early successional openings across this landscape range from less than 100 to several thousand acres in size. Large, fire resistant tree species (e.g., western larch and Douglas-fir) occur in a discontinuous pattern across the landscape, having survived one or more fire events. Even-aged, single canopy forest patches are common, particularly in the early (seedling/sapling) and mid-successional stages of forest development. Over time, large patches of even-aged forest may become more diverse in size and structure, as understory canopy layers of shade tolerant trees develop (subalpine fir and spruce) and other disturbances (such as insects, disease, fires) create smaller patches of different tree sizes, species, or stand structures within the larger patch matrix.

Forests in the cool-moist biophysical setting provide habitat for a variety of wildlife species (see appendix D for a full list of species). Processes (e.g. fire, wind, insects and disease) that create diverse patches and patch sizes also create openings dominated by grasses, forbs and shrubs providing foraging habitat for wildlife species (e.g. a wide variety of plant species that produce berries for grizzly bears as well as willow, alder, or yew that provide cover and forage for species such as snowshoe hares and moose).

In Canada lynx habitat and critical habitat (figure B-17) a mosaic of successional stages promotes the value of critical habitat for the conservation of the Canada lynx. Except in portions of the

wildland-urban interface, patches of dense young, seedling/sapling forests with branches touching the snow surface are interspersed with contiguous and interconnected areas of mature multi-story hare and lynx habitat. Young forests with extremely high densities (e.g., greater than 14,000 stems per acre) occur following fires, but are interspersed in a mosaic with stands of much lower densities that are developing a multi-storied stand structure. Large, stand replacing wildfires may make large areas of lynx habitat temporarily unsuitable, but over time forest conditions within post-fire landscapes promote development of snowshoe hare and lynx habitat to support long-term persistence of lynx populations.

Other than in areas of recent stand-replacing wildfire, patches of shrubs and coniferous trees in the small to large size classes (>5 inches average d.b.h.) are interconnected, allowing animals such as lynx and marten to move within and between home ranges. The width and distribution of patches are highly variable due to environmental conditions which change over time (e.g. disturbance, forest succession), so their location changes over time.

Cold coniferous biophysical setting: Forest patterns across the area generally reflect the variation that might occur in a mixed severity fire regime, where low, moderate and high severity fires would occur. A very diverse mosaic pattern of vegetation conditions occur, reflecting both the influence of natural disturbances and the complex arrangement of site and environmental conditions that prevent or delay the establishment and growth of trees. Variable size patches of small, medium or large trees are intermingled with small and large grass/forb/shrub openings and other non-forest types, such as high-elevation rocklands. Forest characteristics within patches are variable, usually composed of multiple canopy layers, tree ages and size classes. Size of early successional seedling/sapling forest patches, originating mainly from fire, range from small (e.g., 20 acres) to large (e.g., several thousand acres).

Forests provide habitat for a variety of wildlife species (see appendix D for a full list of species). Fires create conditions suitable for regeneration of white-bark pine trees, particularly on dry and exposed ridges and slopes, providing forage for wildlife species such as Clark's nutcrackers. The more gently sloped, moist basin areas are more densely stocked (e.g., 40 to 60% canopy cover), providing cover interspersed with for species such as grizzly bears, elk and mule deer.

In Canada lynx habitat and critical habitat (figure B-17), some patches of high density young forest (seedling/sapling) are present, interspersed with patches of older forests to provide food and cover for snowshoe hares and Canada lynx over long time frames as forest and landscape conditions change. Processes (e.g. fire, wind, insects and disease) that create diverse patches and patch sizes also create openings in moister or more protected sites that support shrub species which provide forage for a variety of wildlife. Large, stand replacing wildfires may make large areas of lynx habitat temporarily unsuitable, but over time forest conditions within post-fire landscapes promote development of snowshoe hare and lynx habitat to support long-term persistence of lynx populations.

Other than in areas of recent stand-replacing wildfire, patches of shrubs and coniferous trees in the small to large size classes (>5 inches average d.b.h.) are interconnected, allowing animals such as lynx and marten to move within and between home ranges. The width and distribution of patches are highly variable due to environmental conditions which change over time (e.g. disturbance, forest succession), so their location changes over time.

### Ecosystem Processes – Fire, Forest Insects and Disease (FW-DC-TE&V)

Native insects and disease function within the range of natural variability across the landscape, influencing forest conditions, successional processes, and habitat for fish and wildlife. Relatively low level of insect and/or disease activity and associated tree mortality occurs in areas where fire hazard or human safety is of concern (i.e. wildland-urban interface, developed recreation sites). Salvage within forests with disease/insect infestations may occur in certain circumstances, as described in other sections of this forest plan (see Forest Vegetation Products: Timber section and suitability determinations under each management area).

- Forests have the necessary conditions (e.g., structure, composition) to be resilient and resistant to non-native insect and diseases.
- Fire occurs as a key ecological process forestwide, creating, restoring and maintaining the desired diversity of vegetation conditions and the resilience of the ecosystem. Planned and unplanned (natural) ignitions are managed to promote fire as an ecological process, recognizing and upholding its natural role in effecting change in vegetation structure and composition over time. Also see Fire and Fuels Management, FW-DC-FIRE-03 and 04.
- Desired ecological conditions in large, unroaded landscapes (such as wilderness, recommended wilderness, and portions of the backcountry management areas) are primarily achieved as a result of natural ecological processes and disturbances, such as fire (both planned and unplanned ignitions) and insect or disease activity. Outside of these landscapes, human influences and actions, such as fire suppression or timber harvesting, are more evident and play a larger role in achieving desired ecological conditions.
- Fires of variable size occur periodically across the Forest, creating recently burned forest conditions (fire event within the preceding 10 years), within the natural range of variation. Both planned and unplanned ignitions will be used to achieve desired conditions. These fires create variable size patches of early successional forest conditions that provide habitat for a wide range of wildlife and plant species. Burned conifers provide habitat for species associated with this condition (such as the black-backed woodpecker or hawk owl). Salvage within burned forests to meet desired conditions may occur in certain circumstances, as described in other sections of this forest plan (see Forest Vegetation Products: Timber section and suitability determinations under each management area). Refer to appendix D for a full list of wildlife species associated with these habitats. Desired characteristics of recently burned forest are described in table 15.

Table 15. Estimated natural range of variation (NRV) and desired conditions forestwide for recently burned forest conditions (fire event within the preceding 10 years)

Severity	NRV a	Ecosystem Processes	Desired condition
Moderate to high severity recently burned forest (greater than 40% mortality of trees in small to large size classes)	1 – 15% of National Forest lands	These burn conditions are created by fires that occur under the mixed and high severity fire regimes, with 35 to 100 year or greater fire intervals. These burn conditions occur across all biophysical settings of the FNF, though they are most common and achieve largest patch sizes in the cool moist-moderately dry setting. Burned patches may be over 30,000 acres in size, though these sizes occur infrequently, closely tied to climate and drought conditions. More commonly, moderate or high severity burn patches are much smaller in size (e.g. less than 1000 acres), especially in the warm moist and warm dry biophysical settings, where they most often occur within a complex matrix of low/moderate/high/unburned patches of forest. Fewer acres of moderate to high severity burn conditions exist in cool and/or moist climatic periods; greater acres exist in warm and/or dry climatic periods.  The patches created by moderate to high severity fires are characterized by an abundance of snags of various sizes and densities, and grasses, forbs and shrubs dominate the ground vegetation. Within a few years, coniferous tree seedlings (and aspen and birch on some sites) are widespread and eventually dominate most sites. In moderate severity fires, there are individuals or small patches of live overstory trees that survive the fire.	Moderate to high severity, recently burned forest conditions are distributed throughout the Forest, varying widely in amount, pattern and frequency over time and space. Recently burned forest conditions are most consistent with NRV in wilderness areas and larger unroaded areas, which will have the majority of acres and the largest patch sizes. Outside these areas, moderate to high severity burned forests will occur over much less acres overall and mostly in relatively small patches (e.g., less than 500 acres). Recently burned sites support an abundance of native grasses, forbs and shrubs, along with low to very high densities of fire killed trees. Fire-killed conifers over 20 inches d.b.h. are present for nesting by black-backed woodpeckers and other cavity nesting or denning species, within patches 100 acres or larger, and available periodically over time, consistent with NRV. Fire-killed trees over 10 inches d.b.h. are available for feeding by black-backed woodpeckers and other wildlife species associated with burned forests (see appendix D for a full list of species).
Low severity recently burned forest (less than 30% mortality of trees in medium and larger size classes)	0 – 2% of Forest lands.	On the FNF, these burn conditions are created by fires that occur mainly under a mixed severity fire regime. They are most common in forests in the warm-dry biophysical setting but also in some forests types in the warm-moist and cold biophysical settings. In these latter settings, these burn conditions usually occur in areas of lower density coniferous tree cover, lower fuel loadings, an abundance of fire resistant tree species, and/or where fire was historically more frequent (e.g., areas where fire use by Native Americans was common).  In patches burned at low severity, tree density is reduced but many, if not most, trees survive the fire, particularly those in the medium and larger tree size classes and the fire tolerant species (e.g., ponderosa pine and larch). Mortality is mostly in small tree sizes (e.g., less than 9 inches d.b.h.) and of species sensitive to fire, such as lodgepole pine and subalpine fir.  Patch sizes and patterns of forest burned at low severity are highly variable, and dictated mainly by the pattern of forest conditions (species,	Low severity burned forest conditions occur across the forest, but mainly in warm dry and warm moist biophysical settings, with patterns and amounts consistent with the NRV. Recently burned sites support an abundance of native grasses, forbs and shrubs. Live tree densities are low to moderate. Fire-scorched conifers over 20 inches d.b.h. are present for nesting cavity nesting or denning species. Smaller snags abundant in some areas, dependent on pre-fire conditions.

Severity	NRV a	Ecosystem Processes	Desired condition
		densities) and site variations (biophysical setting, topography) across the landscape. Larger patches of low severity burn conditions occurred in warm, dry settings, where ponderosa pine was widespread, and fires were frequent, keeping fuel loadings and fire severities lower. Across most of the forested areas of the Forest, low severity burned forest conditions most commonly occur as smaller patches within the matrix created by a larger fire of mixed severities, interspersed with other forest patches that burned at moderate or high severity, and unburned patches.	

<sup>&</sup>lt;sup>a</sup> The NRV for amount of fire is based on decadal variation (i.e. amount of fire over a 10-year period). Objectives (FW-OBJ-TE&V)

## Objectives (FW-OBJ-TE&V)

NRLMD Objectives VEG 01, 02, and 04 apply (see appendix F).

- Vegetation management treatments (e.g. timber harvest, planned ignitions, thinning, planting) on 62,000 to 174,000 acres forestwide to maintain or move towards achieving desired conditions for coniferous forest types and associated wildlife species.
- Vegetation management treatments (e.g. timber harvest, planned ignitions, thinning, planting) on 16,000 to 21,000 acres of forest to contribute to restoration of resistant western white pine and achieve desired conditions for this species presence across the landscape.
- Vegetation management treatments (e.g. timber harvest, planned ignitions, thinning, planting) on 500 to 5,000 acres of forest to contribute to restoration of diverse native hardwood forest types and associated wildlife species.
- Vegetation management treatments (e.g. planned ignitions, slashing, control of non-native, invasive plants) on 1,500 to 5,000 acres to promote persistence of grass/forb/shrub plant communities, focusing on key habitats for big game species and pollinators, to improve conditions for native plant establishment and growth and reduce non-native plants (e.g. planned ignitions,).

## Standards (FW-STD-TE&V)

NRLMD Standards VEG S1, S2, S5, S6 apply (see appendix F) with exception #4 added to Standard VEGS6 as shown in 03 below.

- Alternative B and D: Within the NCDE primary conservation area, all proposed vegetation management projects shall be evaluated for their effects on grizzly bears and their habitat.
  - Alternative C: Within the NCDE Primary Conservation Area and the Salish demographic connectivity area, all proposed vegetation management projects shall be evaluated for their effects on grizzly bears and their habitat.
- In old growth forest, vegetation management activities must not modify the characteristics of the stand to the extent that the stand would no longer meet the definition for old growth (refer to glossary). Vegetation management within old growth shall be limited to actions that:
  - (1) maintain or restore old growth habitat characteristics and ecosystem processes;

(2) increase old growth forest resistance and resilience to disturbances or stressors that may have negative impacts on old growth characteristics (such as drought, high severity fire, bark beetle infestations);

- (3) reduce fuel hazards adjacent to private property or other exceptional values at risk; or
- (4) address human safety.

Vegetation management activities that may be used to meet these requirements include (but are not limited to) planned or unplanned low to mixed severity fire; removal of hazard trees in developed campgrounds; commercial or non-commercial thinning to reduce tree density; or treating insect and disease infestations through integrated pest management strategies.

- O3 See appendix F for full text of NRLMD Standard VEG S6. Modification to the standard is grayedout below. The Standard: Vegetation management projects that reduce snowshoe hare habitat in mature multi-story forests may occur only:
  - 1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or
  - 2. For research studies or genetic tree tests evaluating genetically improved reforestation stock; or
  - 3. For incidental removal during salvage harvest (e.g., removal due to location of skid trails); or
  - 4. For noncommercial felling of trees larger than sapling size within 200 feet of whitebark pine trees (in stands that contain trees identified for cone/scion/pollen collection), to make whitebark pine more likely to survive wildfires, more resistant to mountain pine beetle attack and more likely to persist in future environments.

Exceptions 2, 3 and 4 shall only be utilized in LAUs where Standard VEG S1 is met.

(NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g., uneven age or even-aged management systems could be used to create openings in coniferous forests in the stem exclusion structural stage where there is little understory so that new forage can grow])(NRLMD standard VEG S6, with exception #4 added).

Where and to what this applies: Standard VEG S6 applies to lynx habitat within LAUs; applies to all vegetation management projects except for fuel treatment projects within the wildland-urban interface as defined by Healthy Forest Restoration Act, subject to the following limitation:

Fuel treatment projects within the wildland-urban interface that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a national forest).

For fuel treatment projects within the WUI see guideline VEG G10).

**Exceptions to standard:** This standard does not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads, and the like. This standard does not apply to linkage areas (NRLMD standard VEG S6).

In the absence of a site-specific analysis that supports an alternative prescription for snags or decadent live trees, timber harvest areas shall retain at least the minimum number of snags and/or decadent live trees displayed in table 16. The intent is to provide sufficient habitat both short and long term, well distributed across the landscape, for wildlife species associated with snags and decadent live trees, particularly those that are larger and longer lasting (refer to appendix C). All

western larch, ponderosa pine, and black cottonwood snags greater than 20 inches shall be left. If present, decadent live trees greater than 20 inches d.b.h., especially those with evidence of wildlife use, may be used as a substitute for 20 inch d.b.h. snags, to achieve minimum levels in table 16. Exceptions to this snag retention standard may occur, for example in areas where the minimum number or snags or decadent live trees are not present prior to management activities; where there are issues of human safety (i.e., developed recreation sites); and in areas within 200 feet of a road that is open to firewood cutters. Refer to appendix C for guidance on implementing this snag retention guideline.

Table 16. Snag levels to retain (where they exist) in timber harvest areas

	Minimum number of snags per acre			
Biophysical setting	Greater than or equal to 15 inches d.b.h. <sup>ab</sup>	Greater than or equal to 20 inches d.b.h.°		
Warm-Dry	3	1.4		
Warm-Moist	8	2		
Cool-Moist/Mod. Dry	5	2		
Cold	3	1		

- a. This minimum number includes snags greater than or equal to 20 inches d.b.h.
- b. If snags greater than 15 inches are not available, then snags greater than 12 inches should be retained.
- c. If snags greater than 20 inches are not available, then additional snags or decadent live replacement trees greater than 20 inches d.b.h. should be left if available.

## Guidelines (FW-GDL-TE&V)

NRLMD Guideline VEG G1, G5, and FW-GDL-REC-05 (a modification to G11) apply (see appendix F).

Alternative B and D: Within the NCDE primary conservation area, vegetation and fuels management activities should be restricted in time and space if needed to reduce the potential for adverse grizzly bear disturbance/displacement, as determined by site-specific analysis. *Note*: Management activities such as pre-commercial thinning, burning, weed spraying, and implementation of road best management practices other than instream work may need to be completed during the spring time period in order to meet objectives (especially if needed to prevent resource damage), but should otherwise be restricted in time or space, if needed to reduce the potential for adverse grizzly bear disturbance/displacement (see appendix C for strategies, since this will vary on a site-specific basis).

Alternative C: Within the NCDE primary conservation area and the Salish demographic connectivity area, vegetation and fuels management activities should be restricted in time and space if needed to reduce the potential for adverse grizzly bear disturbance/displacement, as determined by site-specific analysis. *Note*: Management activities such as pre-commercial thinning, burning, weed spraying, and implementation of road best management practices may need to be completed during the spring time period in order to meet objectives (especially if needed to prevent resource damage), but should otherwise be restricted in time or space, if needed to reduce the potential for adverse grizzly bear disturbance/displacement (see appendix C for strategies, since this will vary on a site-specific basis).

Alternative B and D: Within the NCDE primary conservation area, vegetation management activities should be designed to avoid detrimental effects on the grizzly bear population and to include one or more measures to protect, maintain, increase and/or improve grizzly habitat quantity

or quality in areas where it would not increase the risk of grizzly bear–human conflicts (see appendix C for strategies, since this will vary on a site-specific basis).

Alternative C: Within the NCDE Primary Conservation Area and the Salish demographic connectivity area, vegetation management activities should be designed to avoid detrimental effects on the grizzly bear population and to include one or more measures to protect, maintain, increase and/or improve grizzly habitat quantity or quality in areas where it would not increase the risk of grizzly bear–human conflicts (see appendix C for strategies, since this will vary on a site-specific basis).

- Alternative B and D: Within the NCDE primary conservation area, measures to retain cover should be included in the project design if vegetation management activities would result in the loss of cover along grass/forb/shrub openings, riparian wildlife habitat, or wetlands, as determined by a site-specific analysis (see appendix C for strategies, since this will vary on a site-specific basis).
  - Alternative C: Within the NCDE primary conservation area and the Salish demographic connectivity area, measures to retain cover should be included in the project design if vegetation management activities would result in the loss of cover along grass/forb/shrub openings, riparian wildlife habitat, or wetlands, as determined by a site-specific analysis (see appendix C for strategies, since this will vary on a site-specific basis).
- **04** Alternative B and D: Within the NCDE primary conservation area, vegetation management projects (including timber sales and other non-commercial vegetation management contracts) should include a provision providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear-human conflict situation.
  - Alternative C: Within the NCDE primary conservation area and the Salish demographic connectivity area, vegetation management projects (including timber sales and other non-commercial vegetation management contracts) should include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear-human conflict situation.
- **Alternative B and D**: Within the NCDE primary conservation area, vegetation management activities that may enhance grizzly habitat or attract bears (e.g., increase huckleberry production) should be avoided near campgrounds, facilities or other developed sites.
  - Alternative C: Within NCDE primary conservation area and the Salish demographic connectivity area, vegetation management activities that may enhance grizzly habitat or attract bears (e.g., increase huckleberry production) should be avoided near campgrounds, facilities or other developed sites.
- Of Silvicultural practices and prescriptions should generally maintain or trend the forest vegetation towards the desired conditions outlined in this terrestrial vegetation section and other sections of this plan, creating forests more resilient and resistant to disturbances and stressors, including climate change.
- Where feasible and consistent with other resource management direction, landscape patterns and vegetation conditions should be managed to: 1) increase the resilience of old growth forest to potential future disturbance which may result in loss of old growth characteristics (e.g. high severity wildfire or epidemic insect outbreaks); 2) increase the size and shape of old growth forest patches so that there are portions 300 feet or more from early successional forest edge; and 3)

promote the long-term (i.e., beyond the plan period) development of future old growth forests and old growth habitat (refer to appendix C for guidance and examples to achieve this guideline).

- **08** Building of new roads should avoid impacts to old growth where feasible.
- OF Structural components should be retained in timber harvest units to increase diversity and promote desired conditions, consistent with standard FW-STD-TE&V-04 and guidelines FW-GDL-TE&V-10 and 11. Excluded from this guideline are areas and activities where tree removal or vegetative manipulation is conducted to protect health and safety, within developed recreation sites or special use areas.
- In the absence of a site-specific analysis that supports an alternative prescription for downed wood retention, retain a minimum of approximately 10 tons per acre of down woody material greater than 3 inches in diameter within timber harvest units, where available. The maximum amount of total downed woody material should generally not exceed 35 tons per acre. Retained material should consist of the longest and largest available, and where possible, consist of intact pieces of a variety of species, sizes and stages of decay, including cull tops and cull logs. The intent is to contribute to forest structural diversity and provide forest components that are important to many wildlife species. Exceptions may occur, for example when there is insufficient material of suitable size prior to harvest, within developed recreation sites, or where fuel reduction is desired to decrease expected fire behavior (e.g., within wildland-urban interface).
- In the absence of a site-specific analysis that supports an alternative prescription, live trees should be retained in regeneration harvest units (e.g., clearcut, seedtree or shelterwood cuts with reserves) where they contribute to desired forest composition and structure in the short and/or long-term. Species, sizes, density, distribution and other elements of the prescription would be determined on a site and stand-specific basis, incorporating other resource and project-level considerations. The intent includes, but is not limited to, increasing the resilience of the stand and provide potential seed sources in the event of future disturbances (such as fire); retain or develop important forest structural components for biodiversity and wildlife habitat (including development of large trees that may provide future snag habitat); and increase future management options (for example creating more diverse species composition or possible future old growth habitat). Exceptions to this guideline may occur, for example in areas where there are no suitable live trees present, or where it is infeasible to leave live trees due to operational limitations. Refer to appendix C for guidance on implementing this live tree retention guideline.

Live leave tree characteristics best suited to meet the intent of this guideline include:

- Western larch and ponderosa pine. These are fire resistant species of high wildlife habitat value.
- Phenotypically blister-rust resistant western white pine or whitebark pine.
- Retained trees may be of any size class greater than 9" dbh, but generally if less than 15 inches d.b.h., should be of sufficient growth and vigor to achieve very large tree size over time.
- In the absence of a site-specific analysis that supports an alternative prescription, in vegetation treatment units within 1/2 mile of 4<sup>th</sup> order of larger streams and 40+ acre water bodies suitable for bald eagle nesting, live ponderosa pine, western larch, and black cottonwood trees greater than or equal to 20 inches d.b.h. should be retained.

# Native Animal and Plant Species

#### Introduction

The 2012 planning rule adopts a complementary ecosystem and species-specific approach, known as a coarse-filter/fine-filter approach, to provide for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. The coarse-filter plan components are designed to maintain or restore ecological conditions for ecosystem integrity and ecosystem diversity in the plan area within Agency authority and the inherent capability of the land. Plan components found in the "Terrestrial Ecosystem and Vegetation" and "Aquatic Ecosystem" sections address most needs of animal and plant species. Fine-filter plan components are designed to provide for additional specific habitat needs, when those needs are not met through the coarse-filter plan components. The following sections include plan components that address specific needs of animal and plant species that are not be addressed by plan components elsewhere in the plan. Threatened, endangered, proposed, and candidate species are designated by the U.S. Fish and Wildlife Service while species of conservation concern are designated by the Regional Forester. Refer to appendix D for a description of biophysical settings, the acres in each biophysical setting, and lists of animal and plant species and their habitat associations. Refer to appendix C for potential management approaches and possible actions that would contribute towards achieving the desired conditions and objectives.

Plant species currently designated threatened, endangered, proposed and candidate (PLANT)

### **Desired Conditions (FW-DC-PLANT)**

- Habitat conditions support the recovery or long-term persistence of plant species listed as threatened and endangered under the ESA, which include Spalding's catchfly (*Silene spaldingii*) and water howellia (*Howellia aquatilis*). Ecological conditions and processes that sustain the habitats currently or potentially occupied by these species are retained or restored. Refer to appendix D for habitat associations for these species.
- Habitat conditions support the long-term persistence of whitebark pine (*Pinus albicaulis*), which is currently a candidate species under the ESA. Ecological conditions and processes that sustain the habitats currently or potentially occupied by this species are retained or restored.

## Objectives (FW-OBJ-PLANT)

Treat 8,100 to 19,200 acres for the purpose of sustaining or restoring whitebark pine in the ecosystem and contribute to achieving desired conditions for presence of this species across the landscape. Refer to appendix C for information on the restoration strategies and possible management activities to achieve this objective.

## **Standards (FW-STD-PLANT)**

Retain a buffer of a minimum width of 300 feet from the margins of ponds (occupied and unoccupied) that provide *Howellia aquatilis* habitat, for the purpose of maintaining or creating a favorable physical environment in and around the ponds, protecting against adverse hydrological changes, and maintaining the structural and floristic diversity of the vegetation.

### **Guidelines (FW-GDL-PLANT)**

Pond habitat that currently, or potentially, supports *Howellia aquatilis* should be maintained or improved.

Ozound disturbing vegetation treatments within the buffer that surrounds ponds providing water howellia habitat should occur only if the vegetative, physical and/or hydrologic features required for long-term habitat conservation are maintained or improved. Treatments within the buffer should develop vegetation conditions consistent with natural ecological processes, and should sustain soil quality and functioning, so that long term productivity is not impaired. Road maintenance activities within the buffer should maintain or improve hydrological integrity to protect habitat conditions for *Howellia aquatilis*.

To the extent possible, whitebark pine trees identified for collection of scion, pollen or seed, and whitebark pine plantations, should be protected from potential loss due to fire, insect, disease or other threats.

## Plants currently designated species of conservation concern (PLANT SCC)

A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed or candidate species, that is known to occur in the plan areas and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR 219.9). Appendix D identifies the twenty-five currently designated plant species of concern for the Flathead Forest.

#### **Desired Conditions (FW-DC-PLANT SCC)**

**01** Vegetation conditions and ecological processes that currently or potentially support plant species of conservation concern are maintained or restored. Refer to appendix D for a full list of species of conservation concern.

### **Guidelines (FW-GDL-PLANT SCC)**

- When site specific analysis determines that management activities may potentially impact plant species of conservation concern, mitigation or protection measures should be provided to maintain occurrences or sustain habitats of plant species of conservation concern.
- Peatlands (including fens) should be protected from human disturbances that may adversely impact habitat conditions for plant species of conservation concern. (Also see FW-DC-WTR-10,15; FW-DC-WL SOI-01; GS-SV-DC-08 and plan components for MA 3b-Special Areas).

Wildlife species currently designated threatened, endangered, proposed and candidate (WL)

## **Desired Conditions (FW-DC-WL)**

NRLMD goals and objectives for Canada lynx apply (see appendix F).

- Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas; see figure B-01), bear attractants on NFS lands are stored in a manner that reduces the risk of grizzly bear-human conflicts in the NCDE.
- Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), grizzly bear habitat on NFS lands contributes to sustaining a recovered grizzly bear population in the NCDE and contributes to connectivity with neighboring grizzly bear recovery zones.

Within Canada lynx critical habitat mapped by the U.S. Fish and Wildlife Service, boreal forest landscapes support a mosaic of differing forest successional stages providing the physical or biological features essential to the conservation and recovery of the Canada lynx.

- 16 If any new threatened and endangered species and/or their critical habitat are designated, key ecosystem characteristics and conditions on NFS lands contribute to population recovery.
- O5 Community leaders, homeowners, contractors, permittees, and other forest users are knowledgeable about human-bear conflict risk and understand the need to manage human activities to reduce the risk of conflicts.

### Standards (FW-STD-WL)

NRLMD Standards for Canada lynx apply (see appendix F).

- Grizzly bear habitat on NFS lands in the NCDE shall be delineated and managed as the primary conservation area, zone 1 (including the Salish and Ninemile demographic connectivity areas), zone 2, or zone 3 (see figure B-01 or subsequent USFWS updates if applicable).
- Within the NCDE primary conservation area, zone 1 (including the Salish and Ninemile demographic connectivity area; see figure B-01) and zone 2, food/wildlife attractant storage special order(s) shall apply to all NFS lands.

#### **Guidelines (FW-GDL-WL)**

NRLMD Guidelines for Canada lynx apply (see appendix F).

- Within the NCDE primary conservation area, zone 1 (including the Salish and Ninemile demographic connectivity areas), and zone 2, contractors, permittees, lessees, operators, and their employees should be informed of procedures for safely working and recreating in grizzly bear country, and informed about food/wildlife attractant storage special order(s) prior to turn-out of livestock or beginning work and annually thereafter, in order to reduce the risk of grizzly bear-human conflicts.
- Within the NCDE primary conservation area, zone 1(including the Salish and Ninemile demographic connectivity areas; see figure B-01), and zone 2, if a contractor, permittee, lessee, operator or their employees elect to camp on NFS lands other than in a developed recreation site, a site evaluation should be prepared and written authorization (i.e., campsite agreement which includes the food/attractant storage special order) should be obtained.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), clover should not be used in seed mixes on national forest system lands. Native seed mixes or those that are less palatable to grizzly bears should be used so that seeded areas do not become an attractant.

## Wildlife currently designated as species of conservation concern (WL SCC)

A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed or candidate species, that is known to occur in the plan areas and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area (36 CFR 219.9). Table 18 identifies the wildlife species of conservation concern for the Flathead Forest, as identified by the regional forester (also see planning record exhibit C-1 and appendix G-Plan Component Crosswalk).

# **Desired Conditions (FW-DC-WL SCC)**

Habitat conditions and ecological processes that support wildlife species of conservation concern contribute to populations that persist over the long term, with sufficient distribution to be resilient and adaptable to stressors and likely future environments (see table 18). Refer to appendix C for potential management approaches and possible actions.

**Table 17. Desired Conditions for Species of Conservation Concern** 

Species Common Name	Species Scientific Name	Ecosystems/Key Ecosystem Characteristics and Desired Conditions	
Black swift	Cypseloides niger	Waterfalls at least 20 feet tall have shading provided by vegetation or water flow throughout the nesting season in front of potential nest sites.	
Clark's nutcracker	Nucifrage columbiana	Forests in the cold biophysical setting contain live, seed producing whitebark pine trees to provide food and nest sites for Clark's nutcrackers during the breeding season. Forests in the warm-dry and warm-moist biophysical settings contain live, seed producing ponderosa pine trees to provide food in winter (also see FW-DC-TE &V-8. 9, 15).	
Fisher	Pekania [formerly Martes] pennanti	Forests in the warm-moist biophysical setting (mixed coniferous forest (including western larch, white pine, cedar, and hemlock; excluding the ponderosa pine dominance type) and forests in RMZs within the cool-moist biophysical setting, include old growth and mature forest with presence of very large snags/down logs/live trees with heartrot to provide habitat for fisher (also see FW-DC-TE&V 13, 17, and 18). RMZ's provide habitat connectivity for fisher.	
Flammulated owl	Otus flammeolus	Ponderosa pine forests in the warm-dry and warm-moist biophysical setting include old growth and mature forest with presence of large andvery large snags for nesting. These ponderosa pine forests have a patchy structure including areas with an open mid-story and patches of dense Douglas-fir seedlings/saplings in the understory that are intermixed with small openings to provide habitat for flammulated owls during the nesting season (also see FWDC-TE &V-10. 16, 17).	
Harlequin duck	Histrionicus histrionicus	Fast-moving low-gradient streams have high water quality to support aquat insects for feeding. Nesting stream reaches have dense cover adjacent to t stream (including live and dead trees, shrubs, and down logs) and down woody material instream. Human disturbance is low in portions of streams utilized by harlequin duck broods that are less than about 4 weeks old (i.e., before broods move to larger rivers)	
Townsend's big-eared bat	Corynorhinus townsendii	Caves, old mines, old buildings, bridges, and tunnels provide areas for roosting, hibernation, or maternity sites. Caves and mines with evidence of use by Townsend's big-eared bats are accessible to bats. Where possible, old mines and buildings that are used for maternity roosts and hibernacula are stabilized and conserved. Cavers are knowledgeable about and apply techniques to prevent the human-caused spread of disease (e.g. white-nose syndrome) to this and other bat species. RMZ's (e.g. beaver ponds, other wetlands, and riparian areas) provide feeding and roosting habitat. There are low levels of human disturbance at sites known to provide maternity roosts or hibernacula for the Townsend's big-eared bat (also see appendix C).	

#### **Guidelines (FW-GDL-WL SCC)**

01 If mines, caves, or old buildings are closed to reduce safety hazards or vandalism, bat-friendly closures should be installed to maintain bat access, unless surveys indicate bats are not present and habitat is unsuitable. Buildings and bridges should be inspected prior to removal or reconstruction to identify bat use. When bats are present, removal should not begin until bats have left for the

- season. If old buildings or bridges are removed and are not replaced, bat structures should be installed to provide habitat.
- Management actions (e.g. decontamination measures, avoidance of human entry to winter roosts during winter, signs, education of cavers) should be adopted as needed to help prevent or curtail spread of White-nose Syndrome from cave to cave.
- To provide habitat for maternal denning and resting by fisher, vegetation management prescriptions in the warm-moist biophysical setting (excluding the portion with a ponderosa pine dominance type) and in the portion of the cool-moist biophysical setting within RMZ's, should promote development of very large live, dead, and down trees including large western larch, western red cedar, and western hemlock.
- Measures to limit disturbance from project implementation should be applied at active nesting sites of harlequin ducks or black swifts from mid-April to mid-August (see appendix C for strategies, since measures would vary on a site-specific basis).

### Objectives (FW-OBJ-WL SCC)

Maintain or improve 100-1000 acres of habitat (e.g. placement of structures, creating snags) for bats and a wide variety of cavity nesting/roosting/denning species.

Wildlife habitat diversity and associated species of interest (WL SOI)

#### Introduction

To develop the land management plan consistent with maintaining ecosystem diversity, the 2012 planning rule has requirements that the plan must include plan components, including standards or guidelines, designed to maintain, restore, or promote ecosystem diversity, key ecosystem characteristics, and habitat types. The sections on "Aquatic Ecosystems" and "Terrestrial Ecosystems and Vegetation" include plan components that collectively contribute to habitat diversity for wildlife across the plan area. The following section provides some additional plan components that focus on wildlife diversity and species needs. Refer to appendix D for a description of biophysical settings, the acres in each biophysical setting, and lists of animal species and their habitat associations. Refer to appendix B for maps of biophysical settings forestwide and by geographic area. Refer to appendix C for potential management approaches and possible actions that would contribute towards achieving the desired conditions and objectives.

Plan components for aquatic and terrestrial ecosystems provide for the needs of most wildlife species. The following sections include additional plan components that are not specific to threatened or endangered species or species of conservation concern, but apply to habitat needs that may not be addressed by other sections, or for wildlife species that may be sensitive to particular types of human disturbance at particular sites at particular times of year.

#### **Desired conditions (FW-DC-WL SOI)**

Habitat conditions support wildlife diversity, including (but not limited to) neo-tropical migratory birds and species of interest (see table 17, table 18).

Table 17. Desired conditions for wildlife habitat diversity and associated wildlife species of interest

Wildlife habitat	Species of interest	Desired condition description
40+ acre water body or 4th order or larger stream	Bald Eagle	Large-diameter trees >20" d.b.h (especially black cottonwoods) are available within one half mile of 4 <sup>th</sup> order of larger streams and 40+ acre water bodies in order to provide nesting habitat for bald eagles and great blue herons.
Lakes greater than 13 acres	Common loon	Lakes and ponds support nesting by providing shoreline or island sites that have overhead cover and low levels of human disturbance during the nesting period. Small fish are available to provide food.
Lakes, ponds, and wetlands	Boreal toad	The ecological conditions of lakes, ponds and wetlands supports breeding and feeding of boreal toads.
Peatlands (including fens)	Northern Bog Lemming	Areas in and within 300' of peatlands have low groundcover and down woody material that contributes to northern bog lemming habitat and connectivity between clusters of individual sites.
Boulder fields/talus	Pika, Hoary Marmot	Accumulations of boulders and rock have adjacent areas of native forbs and grasses to provide habitat for pikas and hoary marmots.
High elevation cliffs (6,100 to 9,200 feet on Forest)	Mountain Goat	High elevation cliffs that provide known winter concentration areas or kidding areas for mountain goats have levels of human disturbance that don't disrupt mountain goats.

- O2 Cover conditions in RMZs (see figure B-09) provide shade and contribute to habitat connectivity for a variety of wildlife species that use riparian areas for movement corridors (e.g. marten, also see fisher).
- RMZs have highly diverse structure (including large down wood, snags, and decadent live trees) and composition (including shrubs and deciduous trees) to support numerous bats and other mammals, bird, reptile and amphibian species which feed, nest, den or roost near water.
- The public has an understanding of the sensitivity of nesting loons to human disturbance by boats and on shorelines adjacent to active nests. This understanding is facilitated by measures such as floating signs, shoreline signs, and disseminating loon conservation material, in cooperation with partners (See appendices F and H in the Conservation Plan for the Common Loon in Montana 2010 or subsequent MFWP updates if applicable).

### **Guidelines (FW-GDL-WL SOI)**

- Vegetation management activities should maintain sufficient canopy to provide snow intercept cover to meet desired conditions for winter big game habitats, as mapped by Montana Fish, Wildlife, and Parks (since these change over time, specific areas would be identified at the project level).
- Active bald eagle nesting territories (as identified in the MFWP bald eagle nesting territory database) should be managed in accordance with the following recommendations of the Montana Bald Eagle Management Guidelines (or subsequent MFWP updates if applicable):
  - In order to reduce disturbance to nesting bald eagles, visual buffers within ¼ mile of active and alternate bald eagle nest sites should not be removed, but may be enhanced (see appendix C for potential strategies since this will vary on a site specific basis).
- To provide habitat that contributes to reproductive loon populations, Code A territorial nesting lakes (current or recent nesting)(see the Conservation Plan for the Common Loon, appendix A, in

Montana 2010 or subsequent MFWP updates if applicable) should be managed in accordance with the following guidelines:

- Time near-shore disturbance (i.e. timber harvest, fuels reduction, boat launch repairs) within 150 yards of known common loon breeding areas for dates outside of breeding season (see table 18).
- If activities are authorized or conducted (e.g. recreation special use permits that would allow lowaltitude helicopter flights or landings) that are known to disrupt wildlife species listed in table 18 measures should be implemented to avoid adverse impacts to their key habitats during key time periods (see table 18)(see appendix C for possible strategies since this will vary on a site specific basis). This guideline does not apply to existing administrative sites, existing roads or trails, existing developed recreation sites or ski areas, or areas or routes mapped as suitable for motorized over-snow vehicle use (see figures B-03 to B-05).

Table 18. Key habitats and key time periods for species that may be sensitive to human disturbance

Species	Key Habitat	Time period
Mountain Goat	Known winter concentration areas and kidding areas identified by MFWP	December to July
Wolverine	Known wolverine maternal denning habitat	March to mid-May
Elk and deer	Known winter concentration areas identified by MFWP	December to Mid-April
Gray Wolf	Within 0.25 mile of known, active den/rendezvous sites identified by MFWP	Mid-March to July
Bald Eagle	Within 0.5 mile of very large trees used as known, active nest sites (also see guideline 02)	February to Mid-August
Peregrine Falcon	Within 0.5 mile of cliffs used as known, active nest sites	February to Mid-August
Great Blue Heron	Within 0.2 mile of very large cottonwood trees used as known, active nesting rookeries	February to Mid-August
Common Loon	Adjacent to known, active shoreline nesting sites identified during the May survey; distance based upon lake and shoreline configuration (also see guideline 03)	Mid-April to Mid-August
Northern Goshawk	Within 40 + acre forest stands used as known, active nest sites	March to mid-August

When conducting vegetation management projects, cover of trees and/or tall shrubs should be retained (if available) between areas of forest where cover is lacking (e.g. recent stand-replacement fire areas, clearcut, seedtree, or shelterwood harvest units), so that connectivity between forested patches is not severed (See appendix C for information on possible strategies since this will vary on a site specific basis).

## **Objectives (FW-OBJ-WL SOI)**

**01** Install structures such as floating signs to promote successful common loon reproduction on 3-10 occupied lakes annually, as needed.

# Pollinator Species (POLL)

## **Desired Conditions (FW-DC-POLL)**

Plant communities across the forest are composed of a diverse mix of native grass, forb, shrub and tree species, with a diverse structure (including snags and large down woody material) and pattern across the landscape, providing foraging habitat for native pollinator species, such as Gillette's Checkerspot butterfly, bumblebees, and hummingbirds.

## **Guidelines (FW-GDL-POLL)**

An integrated pest management approach should be used when evaluating proposed methods to control pests (such as insects or invasive weeds), considering potential effects to native pollinators and mitigation measures if necessary.

## Non-Native Invasive Plants/Noxious Weeds

## **Desired Conditions (FW-DC-NNIP)**

Native plant species and plant communities dominate the landscape, while invasive plant species are at low abundance or non-existent, especially in areas identified of high priority, including wilderness areas, native grassland plant communities, and riparian areas.

- No new non-native invasive plant species become established in terrestrial or aquatic plant communities on the Forest.
- Terrestrial communities at risk of negative impacts from non-native invasive plants are able to retain or regain function, process and structure after disturbance.
- Invasive plant species are controlled with integrated pest management approaches, which include an effective prevention and education program, combined with mechanical, biological, cultural and chemical methods of weed control. Technological advances in weed treatments are capitalized on if they are shown equivalent to or more effective than existing treatments. Refer to appendix C for guidance on achieving this desired condition.

#### Objective (FW-OBJ-NNIP)

Treat 12,000 to 16,000 acres to contain or reduce non-native invasive plant density, infestation area, and/or occurrence. Highest priority will be given to treating potential invaders or new invaders that are most likely to negatively impact native plant communities and ecosystem integrity.

## **Guidelines (FW-GDL-NNIP)**

Non-native invasive plant treatments within RMZs should consider use of mechanical, biological, and cultural means of control before chemical control methods.

# Fire and Fuels Management

#### Introduction

Wildland fires occur annually with natural ignitions occurring with summer thunderstorms typically starting in mid-July through mid-September. The general public, as well as most large landowners, utilize fire to burn vegetation (both piled and broadcast) in the spring (March–June) and in the fall (September–November). Most other human ignitions are caused by campfires/smoking.

Fire management strives to manage the natural role of fire while protecting values from adverse impacts of fire by implementing a coordinated risk management approach to build landscapes that are resilient to fire-related disturbances and preparing for and executing a safe, effective and efficient response to fire.

Treatment of vegetation for fuels mitigation is typically to change predicted fire intensity, duration and/or mitigate rate of fire spread, and will focus on restoring and maintaining natural fire regimes and reducing the negative impacts of wildfires to watershed health, wildlife habitat and community values at risk.

## Desired Condition (FW-DC-FIRE)

NRLMD Objective VEG 03 applies (see appendix F).

- Fire management activities minimize the risk of loss of life, damage to property or ecosystem function. Firefighter and public safety is the first priority in every fire management activity.
- 102 In areas where wildfires on NFS lands pose a threat to communities and community assets primarily within the wildlife-urban interface (e.g., power lines, communication towers, developed recreation sites, adjacent private land and structures), wildland fuel is reduced so the expected fire behavior is reduced.
- The full range of fire management activities, including wildland fires (prescribed fire and wildfire), are recognized and used by forest administrators as an integral part of achieving ecosystem sustainability, including interrelated ecological, economic and social components such as improved ecosystem resilience and wildlife habitat, protection of property and other values at risk, and public safety.
- Wildland fires burn with a range of intensity, severity, and frequency that allows ecosystems to function in a healthy and sustainable manner and meets desired conditions for other resources. Wildland fire is accepted as a necessary process integral to the sustainability of the forest's fireadapted ecosystems.
- 65 Fire management uses an all lands, landscape approach, which is risk-based, consistent with the current national policy guidance and strategy, responsive to the latest fire and social sciences and adaptable to rapidly changing conditions. The Forest Service concurrently recognizes its responsibility to mitigate hazardous fuel accumulations adjacent to private land and structures where feasible so that fires originating on National Forest System Lands have the opportunity to be contained or reduced in intensity before crossing on to other ownerships or move from other ownership on to the Forest.
- Community leaders, service providers, business owners, homeowners and permittees who are invested in or adjacent to the forest are knowledgeable about wildfire risk. They understand the need to adapt their communities, properties, and structures to wildfire, while recognizing that

wildland fire is an ecological process. The maintenance of defensible space, fire resistant buildings and the reduction of the potential fire intensity around community assets that allows direct suppression tactics are examples of adapting to wildfire.

### Objectives (FW-OBJ-FIRE)

Move toward or maintain the desired conditions for fuel management by treatment (such as mechanical or prescribed fire) of forest vegetation on approximately 50,000 to 75,000 acres, utilizing all available management opportunities with an emphasis on areas that provide for reducing fire impacts to private property.

### Standards (FW-STD-FIRE)

- When wildland fires occur, appropriate response strategies should be developed based on the risk considerations of life, safety and potential resource impacts and with the participation of other responsible agencies, authorities, and jurisdictions as appropriate.
- Manage unplanned fires safely, employing tactics that are cost effective and commensurate with values to be protected or benefits to be accrued.
- Wildfire risk assessments shall be developed to assess conditional thresholds under which desired conditions can be met.
- Vegetation conditions around all structures on administrative and permitted sites should be maintained to provide defensible space and assist with protection.

## Guidelines (FW-GDL-FIRE)

NRLMD Guideline VEG G4 and G10 applies (see appendix F).

- When designing fuels reduction projects, work with partners and adjacent landowners as needed to identify areas and resources of value to improve effectiveness of fuel treatments.
- Use wildfires forest-wide to meet multiple resource management objectives where and when conditions permit and risk is within acceptable limit. Meeting resource objectives generally means progress toward or maintaining desired conditions. See also appendix C: Potential management strategies and possible actions.
- **03** Fire lines should be located and configured away from public access points to prevent their use as travel routes.
- In the wildland-urban interface (figure B-18), where there is close proximity to structures, private property, and administrative sites, and along designed fuel breaks, minimize hazard trees within two tree lengths to maximize personal safety and minimize holding concerns.
- When planning projects to reduce the negative impacts of wildfires or improve fire control opportunities, design treatments to remove or rearrange the material necessary to achieve at least one of the following final outcomes: reduce flame length, rate of spread, or torching and crowning indices.

# Air Quality

#### Introduction

The Clean Air Act and subsequent amendments give federal land managers the responsibility to protect Air Quality Related Values in Class 1 areas and to protect human health and basic resource values in all areas. The Bob Marshall and Mission Mountains wilderness areas are classified as Class 1 areas where very little deterioration of air quality is allowed. Columbia Falls, Kalispell, and Whitefish, are the closest non-attainment areas, although virtually all land management activities on the Forest occur outside the non-attainment boundaries. The Flathead Reservation and Glacier National Park are also Class 1 areas. The greatest potential to affect air quality would be from smoke (wildfires, prescribed fires) and road dust.

### Desired Conditions (FW-DC-AQ)

- The Forest meets applicable federal, state, or tribal air quality standards. Prescribed burning is planned to meet those standards, including areas classified as Class 1 areas (i.e., Bob Marshall Wilderness).
- **O2** Air quality-related values of high quality visual conditions and healthy breathable air are maintained within Class 1 areas.
- Visibility, human health, quality of life, economic opportunities, high quality recreation, and wilderness values are maintained by good air quality. Adverse effects to resources as a result of air pollution do not occur. Ambient air quality and visibility across the Forest are within federal and state standards.

## Standard (FW-STD-AQ)

The Forest will cooperate with federal, state, tribal, and local air quality agencies as appropriate in meeting applicable air quality and smoke requirements.

# Human Uses, Benefits, and Designations of the Forest

## **Recreation Setting and Access**

#### Introduction

Developed and dispersed recreation encompasses a broad and diverse range of activities. On the Forest, there is a variety of recreation opportunities, including motorized and non-motorized travel, horse-back, hiking, hunting, fishing, camping, Nordic skiing, downhill skiing, snowmobiling, viewing natural features, driving for pleasure, mountain biking, floating and recreational boating, berry picking and viewing wildlife

Demographic and population studies show that visitation to the forest and adjacent public land will continue to grow. The Flathead Valley and surrounding areas continue to experience high growth and development. With the increasing numbers of recreationists, the Forest faces the task of managing the land in a way that offers a wide spectrum of opportunities while minimizing conflict between different uses and effects on the environment.

Suitability for motorized and non-motorized recreation has been determined by management areas (see chapter 3). However, there may be routes and areas that are closed to public motorized use within

management areas that are described as suitable for motorized use. In winter, suitability varies by alternative, as displayed in figures B-03 to B-05, and reflects previous planning and recent collaborative efforts. The suitability by management area was then used as a factor, along with routes and terrain, in determining the recreation opportunity spectrum setting. Travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use, along with the suite of forest-wide desired conditions, standards, guidelines, and objectives. Just because an area is suitable for motorized use, does not mean motorized use is allowable everywhere in that setting. Motorized use (wheeled and/or over-snow vehicle) is restricted to designated trails, roads and areas as shown on the motor vehicle use maps for the Flathead National Forest.

### Summer Recreation (SREC)

#### Introduction

The Forest's summer recreation opportunity spectrum settings range from primitive and unroaded backcountry areas that offer solitude and quiet recreation, to roaded settings that connect communities to the forest and offer visitors the opportunity to roam vast distances or gather and socialize with family and friends. Historic log cabins/ranger stations and fire lookouts offer visitors a chance to learn about and experience the rich heritage of early Euro-American settlers. The social, managerial, and physical attributes of the forest's recreation settings are managed to ensure these opportunities are available for future generations to enjoy.

### **Desired Conditions (FW-DC-SREC)**

Summer recreation settings provide a range of opportunities as described by the recreation opportunity spectrum. The desired distribution of recreation opportunity spectrum settings are displayed by alternative in figures B-19 to B-21 and summarized in table 18.

Table 18. Percent of desired summer recreation opportunity spectrum (ROS) settings by alto	rnative
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Summer ROS setting	Alt. B percent	Alt. C percent	Alt. D percent
Primitive	53%	66%	45%
Semi-primitive non-motorized	17%	9%	13%
Semi-primitive motorized	3%	1%	8%
Roaded natural	28%	24%	34%
Rural	<1%	<1%	<1%
Urban	0%	0%	0%

Summer primitive recreation opportunity spectrum settings encompass large, wild, remote, and predominately unmodified landscapes. These settings often coincide with designated and recommended wilderness and inventoried roadless areas. Additional primitive recreation opportunity spectrum settings are scattered across the forest and surrounded by semi primitive non-motorized settings. Primitive recreation opportunity spectrum settings contain no motorized recreation and little probability of seeing other people. Summer primitive settings provide quiet solitude away from roads and people, are generally free of human development, and facilitate self-reliance and discovery. Historic structures such as log ranger stations and fire lookouts are occasionally present. Signing, and other infrastructure is minimal and, when used, are constructed of rustic, native materials.

O3 Summer semi-primitive non-motorized recreation opportunity spectrum settings provide opportunities for exploration, challenge, and self-reliance. Rustic structures such as signs and foot bridges are occasionally present to direct use and/or protect the setting's natural and cultural resources. These rustic constructed features are built from native materials or those that mimic native materials. Closed roads may be present but do not detract from the semi-primitive non-motorized experience of visitors.

- **O4** Summer semi-primitive non-motorized settings are do not contain wheeled motorized recreation travel but mechanized travel may be present.
- opportunitive motorized recreation opportunity spectrum settings provide motorized recreation opportunities in backcountry settings. Routes are designed for off-highway vehicles and high clearance vehicles that connect to local communities, access key destinations and vantage points, provide short day trips on scenic loops or facilitate longer and even overnight, expeditions. Visitors challenge themselves as they explore vast, rugged landscapes. Mountain bikes and other mechanized equipment may also be present. Facilities are rustic and are used for the purpose of protecting the setting's natural and cultural resources. Bridges are sometimes present to accommodate foot, horse and off-highway vehicles traffic but are built from native or natural appearing materials that blend with the surrounding landscape and maintain the semi-primitive character of the setting. There may also be narrow corridors that function as portals for visitors to park their off-highway vehicles and explore adjacent semi-primitive non-motorized and primitive settings on foot or bicycle.
- O6 Summer roaded natural recreation opportunity spectrum is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is well defined and can typically accommodate sedan travel. Sanitation, potable water, interpretive signing, and other amenities are strategically placed to serve as destination points and/or portals to adjacent backcountry settings. Signing, facilities, bridges and other infrastructure are constructed of native materials or natural appearing materials that blend with and compliment the surrounding natural setting
- O7 Summer rural recreation opportunity spectrum settings are high-use areas such as Whitefish Mountain Resort. These highly structured and hardened settings accommodate large group gatherings and serve as day-use destinations. Family reunions, weddings, and local special events often take place here. These settings also function as outdoor classrooms for interpretive programs and other structured learning. Roads and parking areas are generally paved and structures and facilities provide shelter, sanitation, potable water and other amenities.

## Winter Recreation (WREC)

#### Introduction

Recreation opportunity spectrum settings change as snow blankets the Forest's landscapes. While some settings become less accessible and more remote, others change from non-motorized to accommodating over-snow vehicles. Although the full range of settings, primitive to rural, are still present, their location, distribution and percentages change significantly during the winter months. Primitive and semi-primitive non-motorized backcountry settings offer solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Semi-primitive motorized settings cover large expanses of the forest, offering over-snow vehicles the chance to explore areas of the forest that are often non-motorized in the summer months. Roaded natural and rural settings continue to serve as convenient connections to surrounding communities and easy access to visitors. Facilities are operated to provide user comfort. Groomed motorized and non-motorized trails offer users the chance to get outside for a day trip or take

longer, cross-country excursions. Rental cabins are available although some require a ski in or over-snow vehicle trip to access them.

### **Desired Conditions (FW-DC-WREC)**

Winter recreation settings provide a range of opportunities as described by the recreation opportunity spectrum. The desired distribution of recreation opportunity spectrum settings are displayed in figures B-22 to B-24 and summarized in table 19.

able 13. I electrical desired writer recreation opportunity spectrum (NOO) classes			
Winter ROS classification	Alt. B percent	Alt. C percent	Alt. D percent
Primitive	53%	66%	45%
Semi-primitive non-motorized	11%	5%	16%
Semi-primitive motorized	31%	25%	34%
Roaded Natural	4%	4%	5%
Rural	<1%	<1%	<1%
Urhan	0%	0%	0%

Table 19. Percent of desired winter recreation opportunity spectrum (ROS) classes

- Winter primitive recreation opportunity spectrum settings are large, remote, wild, and predominately unmodified. Winter primitive recreation opportunity spectrum settings provide quiet solitude away from roads, and people. There is no motorized activity and little probability of seeing other people. Constructed trails that are evident in the summer months are covered by snow, making these settings appear even more natural and untouched by human management.
- Winter semi-primitive non-motorized recreation opportunity spectrum settings provide backcountry skiing, snowboarding, and snowshoeing opportunities. Trails are un-groomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.
- Winter semi-primitive motorized recreation opportunity spectrum settings provide backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked. There are vast areas to travel cross-country in designated areas, offering visitors an opportunity for exploration and challenge. Occasionally, historic rental cabins are available for overnight use and warming huts are available for short breaks.
- Winter roaded natural recreation opportunity spectrum settings support higher concentrations of use, user comfort, and social interaction. The road system is plowed and accommodates sedan travel. Winter trails are routinely groomed and may have ancillary facilities such as warming huts and restrooms. System roads and trails often provide staging to adjacent backcountry settings (primitive, semi-primitive non-motorized, semi-primitive motorized). Guided motorized over-snow vehicle use, dog sledding, skiing, and snowshoeing may also be present.
- Winter rural recreation opportunity spectrum settings provide high-use ski areas such as Blacktail Mountain and Whitefish Mountain Resort. These areas are accessed from paved and plowed roads and are generally close to population centers. User comfort facilities such as toilets, restaurants, heated shelter facilities, and information and education are commonly present. Parking areas are large and plowed. Entry points and routes are signed and direct over-snow vehicles to adjacent roaded natural and semi-primitive motorized settings. Non-motorized trails are also typically groomed for Nordic skiing. Rural winter settings provide access for communities and families to celebrate holidays, conduct racing events, and skiing.

### Recreation Setting and Access—General (REC)

### **Desired Conditions (FW-DC-REC)**

Within the NCDE primary conservation area, the number, capacity, and improvements of developed recreation sites (GBCS definition) provide for user comfort and safety while minimizing the risk of grizzly bear–human conflicts on NFS lands. See also FW-DC-WL-01 and 02.

- Within each bear management unit in the primary conservation area, increases in the number and capacity of developed recreation sites (GBCS definition) on National Forest System lands that are designed and managed for overnight use during the non-denning season, are limited to levels that are compatible with a stable to increasing bear population.
- The development scale of recreation facilities is consistent with the desired recreation opportunity spectrum settings and with river management, or trail management plans.
- 04 Recreation facilities including toilets, cabins, trailheads, river portals, airstrips, developed campgrounds and visitor centers are maintained to standard to protect forest resources and provide visitor experiences commensurate with the recreation opportunity spectrum setting.
- **05** Recreation facilities and programs incorporate universal design concepts and meet the current Forest Service accessibility guidelines.
- Human-bear conflicts are minimized through proper food and garbage storage where food/garbage is unavailable to bears, and information and education on recreating in bear country that reaches visitors prior to their arrival on forest as well as at areas of concentrated recreation use.
- **07** Livery services on the Forest are provided based on identified public need, protection of resource conditions, and are compatible with other resources.
- New and existing outfitter and guide services respond to public needs, facilitate safe access and provide opportunities for visitors to connect with and learn about the cultural and natural resources of the area.
- Opportunities for outdoor recreation, such as hunting, fishing, wildlife viewing, driving for pleasure, berry picking, hiking, firewood gathering, and bird watching are available for a wide variety of users.
- 10 A variety of motorized and non-motorized winter and summer recreation opportunities are available. Trailheads are strategically located to provide safe, convenient staging to adjacent backcountry settings throughout the year.
- Recreation activities across the seasonal settings contribute to jobs and income in the local economy, community stability or growth, and the quality of lifestyles in the area.
- 12 There are sustainable dispersed recreation opportunities across the Forest. Dispersed recreation opportunities are compatible with the desired recreation opportunity spectrum setting, are managed to minimize user conflicts, and environmental impacts.
- There are sustainable developed recreation opportunities across the Forest. Developed recreation opportunities are compatible with the desired recreation opportunity spectrum setting, are managed to minimize user conflicts, and environmental impacts. Existing developed sites are maintained and updated to accommodate current and anticipated recreation needs. Developed recreation sites are clean, safe and provide for user comfort.
- New and existing special-use permits serve public interest, meet national standards and complement the recreation settings and opportunities. Recreation special uses are used as a tool to provide

desired recreation opportunities, are compatible with the recreation opportunity spectrum setting(s) in which they're permitted, help protect the Forest's cultural and natural resource values, contribute to local economies, and connect people with nature.

- Outfitters and guides on the Forest provide high quality public service, assure public health and safety, protect natural resources, avoid degradation of the social setting and minimize conflict with other users. Their knowledge of the area's cultural and natural resources are important to the delivery of quality, nature and heritage-based opportunities that instill an appreciation and land ethic to clientele.
- 16 The Forest provides recreational cabin rentals that are clean, safe, and compatible with other resources.
- 17 Developed trailheads and river access sites provide appropriate access, parking, and sanitation management for the type of recreation use.
- Additional groomed motorized over-snow vehicle routes are provided that are consistent with the desired winter recreation opportunity spectrum settings, and where compatible with other resources.
- 19 Provide groomed non-motorized winter trail systems that accommodates existing and anticipated demand that are consistent with the desired winter recreation opportunity spectrum setting and suitability determinations, and where compatible with other resources.
- The amount and distribution of motorized over-snow vehicle use does not have demonstrated adverse effects to maternal denning of wolverines or female grizzly bears with cubs during the den emergence time period.
- The Forest provides sufficient law enforcement presence to educate and assist the public and administer forest rules and regulations.
- Developed campgrounds and facilities are maintained to standard to protect forest resources, and updated as needed to accommodate current and anticipated recreation use.
- Trails are maintained to standard to reduce impacts to soil, water, and vegetation and meet health and safety requirements.

#### **Objectives (FW-OBJ-REC)**

NRLMD Objectives HU 01, 02, 03, and 04 apply (see appendix F).

- **01** Rehabilitate 5 to 7 dispersed recreation sites on the Forest with erosion or sanitation issues.
- **02** Provide bear-resistant food storage devices at developed campgrounds.
- **03** Improve 7-12 developed campgrounds. See GA-OBJ for specific numbers.
- **04** Add 2-4 recreational cabin rentals on to the National Reservation System.

#### Standards (FW-STD-REC)

Within the NCDE primary conservation area, the number and capacity of developed recreation sites (GBCS definition) on NFS lands that are designed and managed for overnight use by the public during the non-denning season shall be limited to one new developed recreation site per decade per bear management unit (BMU), or one increase in the overnight capacity at one site per decade per BMU above the baseline (see glossary). A change in the number or capacity of developed

recreation sites may be offset by an equivalent reduction at another site(s) in the same BMU (see also FW-STD-IFS-04). This standard does not limit:

- a change in the number or overnight capacity of developed recreation sites that is necessary to comply with Federal laws (e.g., Rehabilitation Act);
- a change in the number or overnight capacity of developed recreation sites that is necessary to address grizzly bear–human conflicts, resource damage, or human safety concerns;
- an increase in the number of developed recreation sites due to the Forest Service acquiring lands with developed recreation sites.
- Within the NCDE primary conservation area, new or re-authorized recreation permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities if needed to resolve a grizzly bear–human conflict situation.
- New motorized routes or areas available to the public shall not be designated in primitive or semiprimitive non-motorized desired recreation opportunity spectrum settings (winter and summer).
- In alternative C only: Within the NCDE primary conservation area, new or re-authorized permits for ski areas on NFS lands that operate during the non-denning season shall include mitigation measures to reduce the risk of grizzly bear-human conflicts.
- O5 In alternative C only: Within modeled grizzly bear denning habitat in the NCDE Primary Conservation Area, there shall be no increase above the baseline acreage of areas and miles of routes that are open to over-snow vehicle use on National Forest System lands in the den emergence time period (see glossary).

### **Guidelines (FW-GDL-REC)**

NRLMD Guidelines HU G1, G2, G3 and G10 apply (see appendix F).

- Within the NCDE primary conservation area, facilities that provide for day-use developed recreation sites (GBCS definition), or any increases in the number of day-use developed recreation sites (GBCS definition) during the non-denning season above the baseline (see glossary) should include measures to reduce the risk of grizzly bear-human conflicts.
- 102 If there is an increase to the baseline in the number or capacity of overnight developed recreation sites (GBCS definition) under FW-STD-REC-01, the risk of increased grizzly bear-human conflicts should be reduced in the same bear management unit by providing additional information and education, conflict prevention resources (e.g. improved sanitation, backcountry food hanging poles, etc.), or law enforcement and patrols.
- O3 To maintain quality and quantity of water flows to, within, or between groundwater dependent ecosystems, groundwater use developments (e.g., recreation and administrative sites, drinking water wells, waste water facilities) should not:
  - a) Be developed in RMZs (unless no alternatives exist);
  - b) Measurably lower river flows, lake levels, or flows to wetlands or springs (e.g., change springs from perennial to intermittent, or eliminate springs altogether); and/or
  - c) Discharge pollutants directly to groundwater.
- To protect resources, new and reconstructed solid and sanitary waste facilities should be located outside of RMZs.

Alternative B & C: To maintain the quality of lynx habitat and wolverine maternal denning habitat, there should be no net increase in miles of designated motorized over-snow vehicle routes or areas where motorized over-snow vehicle use would be suitable in lynx habitat or wolverine maternal denning habitat on NFS lands at a forestwide scale. Specific locations of routes or areas suitable for motorized over-snow vehicle use are specified in figures B-03 and B-04 (forest-specific modification that replaces NRLMD guideline HU G11, appendix F).

- Alternative D: There should be a net increase of no more than 1% in miles of designated motorized over-snow vehicle routes or areas where motorized over-snow vehicle use would be allowed. See figure B-05.
- To reduce or mitigate potential conflicts between wildlife and event participants as well as with other recreationists, recreation events, group use permits, and commercial activities (see glossary) should include permit measures that address potential conflicts such as but not limited to: location of the event, timing of the event, party size, and education on reduction of human-bear conflicts.
- O7 Avoid placing new facilities or infrastructure within expected long term channel migration zone to reduce potential impacts to fishery resources. Where new activities inherently must occur in RMZs (e.g. road stream crossings, boat ramps, docks, interpretive trails), locate them to minimize impacts on riparian associated resource conditions.
- Where existing recreation facilities are located within RMZs and degrading aquatic or riparian resources, consider removing or relocating such facilities outside of RMZs or other means practicable to reduce effects.

# Hunting, Trapping, Fishing, and Wildlife Viewing (REC WL)

#### Desired Conditions (FW-DC-REC WL)

- Habitat diversity supports species of interest for hunting (e.g., elk, deer, moose, mountain goat, bear, wolf), trapping (e.g., marten, wolf) and subsistence.
- Habitat diversity supports species of interest for viewing (e.g., citizen science activities such as amphibian and raptor surveys, species identified as being of highest inventory need by MFWP).
- O3 Diverse opportunities exist for hunting, trapping, wildlife viewing, and fishing on Forest lands. Examples include assisted outfitted/guided and unassisted, motorized and non-motorized opportunities.
- **04** Levels and types of access for hunting, trapping and fishing contribute to social and economic sustainability.

# Scenery (SCN)

#### Introduction

The Forest's scenery contributes to the identity and sense of place for local communities by serving as the backdrop and backyard to residents. The Forest's scenery is a significant attraction to visitors. The magnificent mountain vistas, meandering rivers, and forested settings are featured by state and local marketing efforts and contribute to the economic sustainability of communities.

#### **Desired Conditions (FW-DC-SCN)**

The Forest's scenery reflects healthy resilient landscapes and exhibits attributes of the scenic character descriptions. Mountain silhouettes, winding rivers, and vast expanses of natural appearing forests enhance the quality of life for residence and visitors.

The Forest's scenery provides a range of scenic quality as described by the scenic integrity objectives. The desired distribution of scenic integrity objectives is displayed in figures B-25 to B-27 and summarized in table 20.

Table 20. Desired scenic integrity objectives for the Forest				
Desired Scenic integrity categories	Alt B	Alt C	Alt D	
Very High	53%			
High	16%			
Moderate	14%			
Low	17%			

Table 20. Desired scenic integrity objectives for the Forest

The rich heritage of the area is apparent—historic cabins and fire lookouts dot the landscape, adding to the unique scenic character of the area. More modern facilities reflect the architectural character of the area and utilize materials that blend with the natural settings.

### **Guidelines (FW-GDL-SCN)**

- To ensure consistency with the desired scenic character of the forest and with the historical and cultural influences of the broader area, the construction or reconstruction of Forest Service facilities (recreation, fire, administrative, and other) and permitted facilities should be consistent with the Built Environment Image Guide.
- To be consistent with the Forest's scenic integrity objectives, deviations that are visible in some areas of the forest should generally be subordinate to the surrounding natural landscape and diminish over time. The maximum degree of deviation should be desired Scenic integrity objectives.
- To maintain the forest's scenic character (figures B-25 to B-27), vegetation management activities should be designed to reflect natural disturbance regimes and processes and minimize visible contrasts with the scenic character.

# Infrastructure (IFS)

#### Introduction

The Forest's infrastructure (i.e., roads, trails, airstrips, and facilities) includes approximately 1,420 miles of open roads, 2,260 miles of system trails, and four airstrips constructed to support forest management activities, such as fire suppression, timber harvesting, and recreation.

In the last few decades, funding has not been sufficient to maintain all forest roads to national standards that are important for minimizing resource impacts. Trail maintenance is generally focused on high-use trails. Overall, fewer trails are being maintained to standard.

Recreation use and the demand for motorized and non-motorized access, especially loop trails, have increased. Advances in performance and technology have resulted in increased use during summer and winter by OHVs, mountain bikes, and motorized over-snow vehicles.

#### **Desired Conditions (FW-DC-IFS)**

NRLMD Guideline HU 05 and 06 apply (see appendix F).

- Within the NCDE primary conservation area, motorized access provides for multiple uses (such as harvesting of timber and non-timber forest products; hunting, fishing, and recreation opportunities) on NFS lands while providing open motorized route density, total motorized route density and secure core levels that contribute to sustaining a recovered grizzly bear population in the NCDE. See also FW-DC-WL-02.
- Motor vehicle use designations are complete and motorized vehicle use maps are available. User conflicts are minimized. Loop opportunities are a part of both the road and trail systems. Community involvement is promoted and user awareness programs (educational and informational) enhance the recreational experience. Partnerships are developed with various interest and user groups to participate in evaluation, planning, and maintenance programs for both roads and trails.
- Public access is provided to NFS lands. A well planned cooperative road system provides improved and cost efficient access to not only NFS but interspersed private and state lands.
- The transportation system serves land management and public needs and purposes. It is interconnected with federal, state, and local public roads and trails to provide access to lands, infrastructure, and inholdings where appropriate. Although roads maintained for passenger cars meet public road safety standards, roads maintained for high clearance vehicles may have hazards and require operator judgment and skill to negotiate. Road management objectives and trail management objectives are identified and kept current for all roads. Roads and trails are maintained in accordance with road and trail management objectives. Roads and trails are connected to state, county, city, private, tribal and other federal roads and trails. The transportation system provides reasonable access for program management, and to facilities, private in-holdings, and infrastructure (e.g., buildings, recreation facilities, municipal water systems, reservoirs, electronic and communication sites, and utility lines).
- Roads not needed to serve management and public needs and purposes are placed in intermittent stored service or decommissioned to benefit fish and wildlife (prioritizing native fish habitat, enhance the desired recreation opportunity spectrum settings and opportunities and grizzly bear habitat), or contributes to a more cost efficient transportation system.
- Of The Forests' trail system provides a variety of motorized and non-motorized recreational opportunities during summer and winter that is distributed across the Forest. Trails access destinations, provide for loop opportunities that also connect to a larger trail system, provide linkage from local communities to the Forest, and are compatible with other resources.
- Forest system trails are sustainably designed and managed to provide a variety of high-quality motorized and non-motorized summer and winter public access that connects people to nature. Trails are maintained in accordance with trail management direction.
- **08** Trails are in the appropriate trail class for existing use levels and use type.

**09** A sustainable trail system exists that meets current and anticipated demands, while protecting natural and cultural resources.

- Access to the national forest is provided to Tribal members for effective exercise of Treaty reserved hunting, fishing, and gathering rights, as well as cultural and religious practices.
- 11 Road closure devices are maintained to be effective.
- Existing airstrips (Condon, Meadow Creek, Spotted Bear, Schafer) on NFS lands are maintained to provide for quality recreational opportunities and administrative needs.
- 13 Infrastructure placement avoids permanent loss of Canada lynx habitat or critical habitat.
- 14 Maintenance along open roads will include application of best management practices to minimize adverse water quality impacts and the felling and removal of hazard trees to minimize risks to safety.
- 15 Roads do not present substantial risks to aquatic resources.

### **Objectives (FW-OBJ-IFS)**

- **01** Decommission or place into intermittent stored service 30 to 60 miles of roads. Priorities shall include roads causing resource damage in priority watersheds and/or where roads are within desired non-motorized ROS settings.
- O2 Complete 100 to 300 miles of reconstruction or road improvement projects within desired roaded ROS settings.
- Maintain up to 1,200 miles of operational maintenance level 2 through 5 roads.
- Maintain up to 2,260 miles of NFS trails.
- **05** Reduce deferred trail maintenance backlog by 10-25 percent.
- **06** Annually, reconstruct 25 to 30 miles of trail.

#### Standards (FW-STD-IFS)

NRLMD Standard LINK S1 applies (see appendix F).

- Within the NCDE PCA, motorized use of roads with public restrictions shall be permitted for administrative use (see glossary), as long as it does not exceed either 6 trips (3 round trips) per week OR one 30-day unlimited use period during the non-denning season (see glossary). Exceptions to this standard include:
  - Emergency situations as defined by 36 CFR 218.21

Note: Administrative use is not included in baseline calculations and is not included in calculations of net increases or decreases.

In each bear management subunit within the NCDE primary conservation area, there shall be no net decrease to the baseline (see glossary) for secure core and no net increase to the baseline open motorized route density or total motorized route density on National Forest System lands during the non-denning season (see glossary), with the following exceptions:

• temporary use of a motorized route for a project (see "project in grizzly bear habitat in the NCDE" definition in the glossary and **FW-STD-INF-03**)

- mining activities (as authorized under the Mining Law of 1872) and oil and gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of 1987) conducted in accordance with valid existing rights and applicable standards and guidelines;
- updated/improved data on a motorized route without an actual change on the ground;
- changes in technology or projections result in changed calculations without actual change on the ground (e.g., a switch from North American Datum of 1927 to North American Datum of 1983 which are geodetic reference systems);
- a road closure location is moved a short distance (e.g. to the nearest intersection or turnout) to a better location to allow turn-arounds providing for public safety, to reduce vandalism, or to improve enforcement of the road closure;
- the agency exchanges, acquires, buys or sells lands;
- a change in a motorized route is necessary to comply with Federal laws (e.g., Federal Rehabilitation Act);
- a change in a motorized route is necessary to address grizzly bear–human conflicts, human safety concerns or resource damage/concerns (e.g. a road paralleling a stream may be decommissioned and replaced by a new upslope road to reduce water quality impacts);
- a change is made by an adjacent landowner that decreases secure core or increases motorized route densities on a particular national forest;
- emergency situations as defined by 36 CFR 215.2;
- temporary roads (see glossary).
- In each bear management subunit within the NCDE primary conservation area, temporary changes in the open motorized route density, total motorized route density, and secure core shall be calculated for projects (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary).

The 10-year running average for open motorized route density, total motorized route density, and secure core numeric parameters shall not exceed the following limits per bear management subunit:

- 5% temporary increase in open motorized route density in each subunit (i.e., OMRD baseline plus 5%);
- 3% temporary increase in total motorized route density in each subunit (i.e., TMRD baseline plus 3%);
- 2% temporary decrease in secure core in each subunit (i.e., secure core baseline minus 2%).

Exceptions to this standard include:

- emergency situations as defined by 36 CFR 215.21;
- actions where valid existing rights preclude or constrain agency discretion (e.g., certain contracts, permits, leases, etc.).

(Refer to appendix C for an example of how to calculate and apply the running average and temporary increase/decrease).

In alternatives B and D: Within the NCDE primary conservation area, restricted roads may be temporarily opened for public motorized use to allow authorized uses such as for firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons.

In alternative C: Within the NCDE primary conservation area, restricted roads may be temporarily opened for public motorized use to allow authorized uses such as for firewood gathering, provided the period of use does not exceed 30 consecutive days and occurs outside of spring and fall bear hunting seasons. Roads within secure core shall not be opened for temporary motorized use by the public.

- **05** During dust abatement applications on roads, chemicals shall not be applied directly to watercourses; water bodies (e.g., ponds, lakes); or wetlands.
- **06** For new road construction and reconstruction of existing road segments, do not side-cast fill material.
- To maintain free-flowing streams, new, replacement, and reconstructed stream crossing sites (culverts, bridges and other stream crossings) shall accommodate at least the 100-year flow, including associated bedload and debris.

#### **Guidelines (FW-GDL-IFS)**

NRLMD Guideline HU G6, G7, G8, and G9 and ALL G1 apply (see appendix F).

- In each bear management subunit within the NCDE primary conservation area, projects (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary) should be designed so that onthe-ground implementation does not exceed 5 years in a 10-year period, to reduce the potential for grizzly bear disturbance or displacement. Exceptions may be made where necessary, for example to accommodate:
  - contracts, permits, and leases which are subject to existing rights;
  - prescribed burning (including slash disposal), best management practices to protect water quality, and required reforestation activities;
  - emergency situations as defined by 36 CFR 215.21.

If an extension to the 5-year time limitation is required (e.g., to meet contractual obligations or to complete on-the-ground treatments), the reasons should be documented in writing prior to authorization of the extension.

- Within the NCDE primary conservation area, levels of secure core, open motorized route density and total motorized route density should be restored to pre-project levels (as defined by "project in grizzly bear habitat in the NCDE" in the glossary) within 1 year after completion of the project, in order to reduce the duration of grizzly bear displacement or disturbance due to project-related activities. Exceptions may be made where necessary, for example to accommodate:
  - contracts, permits, and leases which are subject to existing rights;
  - prescribed burning (including slash disposal), best management practices to protect water quality, and required reforestation activities;
  - emergency situations as defined by 36 CFR 215.2.

If an extension to the 1-year time limitation is made (e.g., to meet contractual obligations or to complete on-the-ground treatments), the reasons should be documented in writing prior to authorization of the extension.

- Roads, skid trails, temporary roads, and trails should have a water drainage system that is hydrologically disconnected from delivering water, sediment, and pollutants to water bodies, (except at designated stream crossings) to maintain the hydrologic integrity of watersheds.
- To reduce the risk to aquatic resources when deciding to decommission roads, make roads impassable, or store roads longer than 1 year, roads should be left in a hydrologically stable condition.
- When placing physical barriers such as berms on travel routes (e.g., roads, skid trails, temporary roads, and trails), assure that routes are assessed and that road drainage features are in place to avoid future risks to aquatic resources. See also FW-GDL-IFS-9.
- To maintain and/or improve watershed ecosystem integrity, and reduce road-related mass wasting and sediment delivery to watercourses, new and relocated road, trail, (including skid trails and temporary roads) and other linear features<sup>6</sup> should avoid lands with high mass wasting potential.
- 07 To maintain free-flowing streams, new, replacement, and reconstructed stream crossing sites (culverts, bridges and other stream crossings) should prevent diversion of stream flow out of the channels in the event the crossing is plugged or has a flow greater than the crossing was designed.
- **108** To maintain channel stability and reduce sediment delivery to watercourses, trails, fords, and other stream crossings should be hardened to protect the stream bed, banks, and approaches.
- 69 For maintenance activities such as road blading and snow plowing on existing roads, minimize side-casting, particularly into or adjacent to water bodies. Care should be taken when plowing snow so as not to include road soil and breaks should be designed in the snow berms to direct water off of the road.
- Wetlands and unstable areas should be avoided when reconstructing existing roads or constructing new roads and landings. Minimize impacts where avoidance is not practical.
- Minimize sediment delivery to streams from roads. Road drainage should be routed away from potentially unstable channels, fills, and hillslopes. For road segments that chronically fail, reduce effects on desired riparian conditions from future prism failures.
- To provide safe and functioning airstrips, management and maintenance of all airstrips should follow Federal Aviation Administration recommendations.
- Within areas specifically identified as being important for wildlife connectivity across highways (see table 21), the USFS should cooperate with highway managers and other landowners to implement crossing designs that contribute to wildlife and public safety.

Table 21. Attributes of priority wildlife mitigation sites based on connectivity value and projected traffic volume (Ament et al 2014<sup>7</sup>).

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<sup>&</sup>lt;sup>6</sup> Linear features include powerline right of ways and utility corridors

<sup>&</sup>lt;sup>7</sup>Ament, R., R. Callahan, M. McClure, M. Reuling, and G. Tabor. 2014. Wildlife Connectivity:

Segment	Segment Description	Route	Site	Mile Marker	Connectivity Values	Projected Traffic Volume
1	east of Essex	U.S. 2	1a	181-184	black bear and forest generalist corridors, wildlife trails	2,400
1	east of Essex	U.S. 2	1b	189-190	wolverine and forest generalist corridors, forest centrality, wildlife trails	2,400
2	east of Columbia Falls	U.S. 2	2a	141-143	black bear and lynx corridors	8,900
3	north of Columbia Falls	Rt 486	3a	7-9	black bear, lynx, and forest generalist corridors	800
4	between Whitefish and Eureka	U.S. 93	4a	148	grizzly linkage zone, forest centrality	3,800
4	between Whitefish and Eurela	U.S. 93	4b	157-160	grizzly linkage zone, black bear and forest generalist corridors	3,700

- 14 Transportation infrastructure should be designed to maintain natural hydrologic flow paths to the extent practical e.g. streams should have crossing structures and not be routed down ditches.
- In fish bearing streams, construction, reconstruction, or replacement of stream crossings should provide and maintain passage for all life stages of native aquatic organisms unless barriers should be created or maintained to prevent spread or invasion of non-native species in alignment with fish management agencies.
- 14 Construction, reconstruction, or replacement of stream crossings should allow passage for other riparian dependent species.

## Lands and Special Uses (LSU)

#### Introduction

Management of NFS lands on the Forest is important to protect the public's estate interest in its national forest. Surveying and posting the national forest boundary, maintaining posted property lines, and defending public lands from trespass or encroachment are activities that maintain the integrity of the NFS. About 1,050 miles of property boundary lines have been surveyed, marked and posted, out of 1,430 total miles (73 percent complete). Approximately 610 miles of non-property boundaries such as wilderness boundaries, have been identified as needing to be surveyed and posted.

Land ownership adjustments are one of the tools used to simplify and improve management of NFS lands. The acquisition, protection, and management of road and trail rights-of-way also ensure public access to NFS land.

Special use permits authorize the occupancy and use of NFS land by private individuals or companies for a wide variety of activities, such as roads, utility corridors, communication sites, and other private or commercial uses, that cannot be accommodated on private lands.

Fundamentals for conservation action. Center for Large Landscape Conservation: Bozeman, Montana (*or subsequent updates*).

#### **Desired Conditions (FW-DC-LSU)**

NRLMD Objective LINK 01 and Objective HU 05 apply (see appendix F).

01 Land ownership adjustments, through purchase, donation, exchange, or other authority, improve national forest management by consolidating ownership, reducing wildlife-human conflicts, providing for wildlife habitat connectivity, improving public access to public lands, retaining or acquiring key lands for wildlife and fish and within Wild and Scenic River corridors.

- **02** Existing road and trail easements that allow access to and/or across NFS land are maintained and additional easements are acquired as necessary.
- Utility corridors and communications sites use existing facilities, sites, and corridors unless new sites can provide better social, economic, and ecological benefits.
- **04** Utility corridors and communications sites are sized to fit the intended use and obsolete or unused facilities are not present on the landscape.
- NFS property lines adjacent to private land and boundaries of special areas such as designated wilderness lands are clearly marked where inadvertent trespass and encroachment is most likely.
- Of Conservation easements are managed to standard, and opportunities are explored for purchasing additional easements to maintain and protect wild and scenic river values.
- 07 Occupancy trespass on NFS lands does not exist.
- **O8** Special use authorizations meet forest management and public needs consistent with the recreation opportunity spectrum and ecosystem desired conditions.
- 09 The existing recreation residences special-uses would continue to be permitted on the Forest.

#### **Standard**

O1 Special use permits for apiaries (beehives) shall include measures including electric fencing to reduce the risk of grizzly bear–human conflicts, as determined by a site-specific analysis.

### **Guideline (FW-GDL-LSU)**

NRLMD Guideline LINK G1 and HU G12 apply (see appendix F).

- **O1** Special use authorizations in the primary conservation area should have permit requirements that reduce or limit the risk of grizzly bear-human conflicts.
- Authorizations for new special uses and re-authorizations for existing special uses (including, but not limited to water diversion or transmission facilities (e.g, pipelines, ditches), energy transmission lines, roads, hydroelectric and other surface water development proposals) should result in the reestablishment, restoration, or mitigation of habitat conditions and ecological processes identified as being essential for the maintenance or improvement of habitat conditions for fish, water and other riparian associated species and resources. These processes include in-stream flow regimes, physical and biological connectivity, water quality, and integrity and complexity of riparian and aquatic habitat.
- 03 Locate new support facilities outside of RMZs. Support facilities include any facilities or improvements (e.g., workshops, housing, switchyards, staging areas, transmission lines) not directly

integral to the production of hydroelectric power or necessary for the implementation of prescribed protection, mitigation or enhancement measures.

**04** If existing support facilities are located within the RMZs, they should be operated and maintained to restore or enhance aquatic and riparian associated resources. At time of permit reissuance, consider removing support facilities, where practical.

# **Special Designations**

#### Introduction

Special designated areas are identified on the Forest because of their unique or special characteristics. The Forest currently has congressionally designated wild and scenic rivers, wilderness areas, and national scenic and historic trails.

Refer to chapter 3, management area direction, for plan components relating to the special designations of wilderness (MA 1a), wild and scenic rivers (MA 2a), special areas (MA 3a) and RNAs (MA 4a). Plan components for the national trails special designations are provided below.

### National Scenic Trails (NST)

#### **Background**

Congressionally designated national trails are a network of scenic, and recreation trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs, promote the enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources, and encourage public access and citizen involvement. These trails are generally are single track, linear features that pass through a great variety of physical features, ranging from natural-appearing settings to locations where developments are noticeable. There are two national congressionally designated trails on the Forest: the Continental Divide National Scenic Trail that includes 18 miles on the Forest (all within designated wilderness) and the Pacific Northwest National Scenic Trail that includes 28 miles on the Forest. Management of the Continental Divide National Scenic Trail is outlined in the 2009 Continental Divide National Scenic Trail Comprehensive Plan. Refer to figures B-28 maps of these trails. The corridor width is 1 mile wide (figures B-29 and B-30).

### **Desired Conditions (FW-DC-SD NST)**

- National scenic trails outside wilderness are clearly marked and identified for users with the national recreation or scenic trail symbol, especially at the trail termini and junctions with side trails. Access allows for public use, interpretation, and education of the specified feature of the trail in a manner that does not impair the feature(s) for which the individual trail was established.
- The Pacific Northwest National Scenic Trail provides a unique pathway that travels through some of the most spectacular and scenic terrain in the United States and connects people and communities of the Pacific Northwest. The Pacific Northwest National Scenic Trail provides conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural qualities of the areas through which it passes through.
- 03 The Continental Divide National Scenic Trail provides high-quality scenic, primitive hiking and horseback riding opportunities while conserving the natural, historic, and cultural resources within the Continental Divide National Scenic Trail corridor.

#### Standards (FW-STD-SD NST)

No surface occupancy for oil and gas leasing activities shall occur and no common variety mineral extraction occurs within the national trail corridor. Refer to figure B-29 for a map of the Pacific Northwest National Scenic trail corridor.

### **Guidelines (FW-GDL-SD NST)**

To maintain the outstanding features of the Continental Divide National Scenic Trail and the Pacific Northwest National Scenic Trail and be compatible with the surrounding environment, facilities, trail facilities should blend in with the surrounding environment. Where the trail leads to an outstanding destination feature, the qualities of that feature are preserved.

**02** To maintain and protect the scenic qualities of the Pacific Northwest National Scenic Trail and the Continental Divide National Scenic Trail, management activities should be consistent with the scenic integrity objective of high to very high.

## **Production of Natural Resources**

Forest Vegetation Products: Timber (TIMB)

#### Introduction

The planning rule requires identification of lands that are suited and not suited for timber production, based on several factors that include legal withdrawal (e.g., timber production prohibited due to statute, Executive order, etc.), technical factors (non-forest lands, geology or soil conditions, etc.), and compatibility with desired conditions and objectives stated in the plan (forest-wide or management area plan components). Table 22 displays the timber production suitability classification for the proposed action. Refer to appendix C for a discussion of timber suitability forestwide by alternative.

Table 22. Timber production suitability classification

Land Classification Category	Alt B	Alt C	Alt D
A. Total National Forest System lands in the plan area	2,392,800	2,392,800	2,392,800
B. Lands not suited for timber production due to legal or technical reasons	1,655,400	1,655,400	1,655,400
C. Lands that may be suited for timber production (A-B)	737,400	737,400	737,400
D. Total lands suited for timber production because timber production is compatible with the desired conditions and objectives established by the plan	499,100	317,300	500,400
E. Lands not suited for timber production because timber production is not compatible with the desired conditions and objectives established by the plan $(C-D)$	238,300	420,100	237,000
F. Total lands not suited for timber production (B+E)	1,893,700	2,075,500	1,892,400

<sup>&</sup>lt;sup>a</sup> Acres are from GIS dataset and analyses. The official acres for NFS lands can be found in the land area report, <a href="http://www.fs.fed.us/land/staff/lar-index.shtml">http://www.fs.fed.us/land/staff/lar-index.shtml</a>.

Per the National Forest Management Act (NFMA) and planning rule regulations, the quantity of timber that may be sold must be less than or equal to the potential sustained yield limit (SYL). The SYL is the amount of timber, meeting applicable utilization standards, "which can be removed from [a] forest annually in perpetuity on a sustained-yield basis" (NFMA at section 11, 16 USC 1611; 36 CFR 219.11(d)(6))). It is the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity.

To clearly display the intended timber program, the plan identifies the projected wood sale quantity (PWSQ) and the projected timber sale quantity (PTSQ). The PWSQ is the estimated output of timber and all other wood products (such as fuelwood, firewood, or biomass) expected to be sold during the plan period for any purpose (except salvage harvest or sanitation harvest) on all lands in the plan area. The PTSQ is the portion of the PWSQ that is the quantity that meets applicable utilization standards. Both the PWSQ and the PTSQ are based on the fiscal capability and organizational capacity to achieve the desired conditions and objectives in the plan for the plan period. Fiscal capability and organizational capacity is based on current budget levels. The resulting PTSQ and PWSQ are found in objectives FW-OBJ-TMB 01 and 02. These timber volume outputs are less than the Sustained Yield Limit (SYL) of 25.4 MMCF per year.

### Desired Condition (FW-DC-TIMB)

Production of timber contributes to ecological sustainability and associated desired conditions, and contributes jobs and income to the local economy. A sustainable mix of timber products (including both sawtimber and non-sawtimber) is offered under a variety of harvest and contract methods in response to market demand.

- In areas suitable for timber production, dead or dying trees (due to fire, insects, disease) are salvaged to recover as much of the economic value of the wood as possible while achieving desired conditions and management direction for other resources (e.g., wildlife habitat, snags).
- 03 Lands identified as suitable for timber production have a regularly scheduled timber harvest program that provides jobs and income while achieving ecosystem resilience and sustainability by meeting management direction and desired conditions for the area.
- 04 Lands identified as not suitable for timber production, but where timber harvesting could occur for other multiple-use purposes, have an irregular, unscheduled timber harvest program. Harvest meets management direction and desired conditions for the area, while providing services and benefits to people.
- Forest conditions on lands suitable for timber production are conducive to providing desired timber outputs at a sustainable level, and vegetation treatments are designed to move forests towards desired conditions (such as size classes, forest landscape patterns, tree densities, and resilience to insects and disease). A variety of silvicultural practices are used to achieve desired conditions, including regeneration harvest, planting of trees, thinning and fire (wildfire and prescribed fire).
- Natural ecosystem disturbances (e.g. fire, insects, disease) occur within forests on the lands suitable for timber production, though loss of the timber resource to these disturbances is generally low.
- O7 Soil impacts are minimized and previously managed areas that have incurred detrimental soil disturbance recover through natural processes and/or restoration activities. Organic matter and woody debris, including large diameter logs, tops, limbs, and fine woody debris, remain on site after vegetation treatments in sufficient quantities to retain moisture, maintain soil quality, and enhance soil development and fertility by periodic release of nutrients as they decompose. Refer also to Soils section of this plan.

# Objectives (FW-OBJ-TIMB)

- Annually, offer timber for sale at an average PTSQ of 27.4 MMBF (5.5 MMCF) under Alternative B, 18 MMBF (3.9 MMCF) under Alternative C, or 29.2 MMBF (5.9 MMCF) under Alternative D.
- Annually, offer commercial timber and other products for sale at an average annual PWSQ of 6.3 MMCF under Alternative B, 4.5 MMCF under Alternative C, or 6.8 MMCF under Alternative D.

## Standards (FW-STD-TIMB)

Also see FW-STD-IFS-01, 02, 03 and FW-GDL-IFS-01 and 02 for standards and guidelines applicable to timber projects.

Timber shall not be harvested on lands where soil, slope or other watershed conditions may be irreversibly damaged, as identified in project specific findings.

Timber harvest activities shall only be used when there is reasonable assurance of restocking within 5 years after final regeneration harvest. Restocking level is prescribed in a site-specific silvicultural prescription for a project treatment unit and is determined to be adequate depending on the objectives and desired conditions for the Plan area. In some instances, such as when stands are treated to reduce fuel loadings, to create openings for scenic vistas or to prevent encroaching trees to meet desired vegetation or wildlife habitat conditions, it is acceptable not to restock or restock at low tree densities.

- O3 Silvicultural treatments shall not be selected based solely on their ability to provide the greatest dollar return.
- Old Clearcutting shall be used as a harvest method only where it has been determined to be the optimum method, and other types of even-aged harvest shall be used only where determined to be appropriate. Determinations shall be based on site specific conditions and the desired conditions for vegetation, wildlife habitat, scenery and other resources.
- MMCF (25.4 MMCF per year) with the following exceptions:; salvage or sanitation harvesting of timber stands that are substantially damaged by fire, windthrow, or other catastrophe or which are in imminent danger from insect or disease attack. Salvage harvest of trees substantially damaged by fire, windthrow, or other catastrophe or in imminent danger from insect or disease attack may be harvested over and above the SYL, consistent with desired conditions for terrestrial and aquatic ecosystems.
- Even-aged stands shall generally have reached or surpassed culmination of mean annual increment (achieving 95 percent of culmination of mean annual increment, as measured by cubic volume) prior to regeneration harvest, unless the following conditions have been identified during project development:
  - a. When such harvesting would modify fire behavior to protect identified resource, social or economic values.
  - b. When harvesting of stands will trend landscapes toward vegetation desired conditions.
  - c. When harvest uses uneven-aged silvicultural systems, thinning, or other intermediate stand treatments that do not regenerate even-aged or two-aged stands.
  - d. When harvest is for sanitation or salvage of timber stands that have been substantially damaged by fire, wind-throw, or other catastrophe or which are in imminent danger from insect or disease attack.
  - e. When harvest is on lands not suited for timber production and the type and frequency of harvest is due to the need to protect or restore multiple use values other than timber production.
- 07 The maximum opening size created by clearcutting, seedtree cutting, shelterwood seed cutting or other cuts designed to regenerate an even-aged stand of timber in one harvest operation shall be 40 acres. This standard applies to new harvest proposals on NFS lands only and need not consider existing recently created openings on NFS land, adjacent private or other agency lands.
  - Exceptions to the 40 acre maximum opening size may occur when determined necessary to help achieve desired ecological conditions for the plan area. These desired conditions include those associated with forest patterns, patch sizes and forest resilience both in the short and long term (FW-DC-TE&V-03, 04, 15, 19; FW-DC-TIMB-06); and the guidelines that help achieve these desired conditions (FW-GDL-TE&V-06, 07; FW-GDL-SCN-03). Maximum opening sizes under

this exception are displayed in table 23. Appendix C provides guidance and management strategies for implementation of this standard.

Table 23. Maximum opening size created by even-aged harvest in one harvest operation

Biophysical Setting	Maximum opening size
Warm dry and Warm moist	80
Cool moist-Moderately dry	130
Cold	70

- Harvest openings created as a result of one harvest operation that exceed the maximum opening size established in table 23 will require 60-day public review and Regional Forester approval.
- OP The maximum opening size displayed in table 23 and the 60-day public review and regional approval process shall not apply to the size of harvest openings created as a result of natural disturbances, such as fire, windstorms, or insect and disease infestations.

### Guidelines (FW-GDL-TIMB)

- O1 Timber harvest on lands identified as not suitable for timber production, but where timber harvesting is allowed for other multiple-use purposes, should apply silvicultural practices that meet desired conditions for forest vegetation. Purposes for timber harvest on these lands may include salvage of dead or dying trees; hazardous fuels reduction; forest insect or disease mitigation; to trend conditions towards desired stand or landscape vegetation composition, structure, and patterns; maintenance or enhancement of wildlife habitat; to perform research or administrative studies; to address issues of public safety and health; or for recreation and scenic-resource management purposes.
- When salvaging timber in areas burned by wildfire, unburned patches or patches burned with low severity within the burn perimeter should be retained to provide wildlife habitat diversity.
- When salvaging timber in areas severely burned by wildfire, clusters of burned trees with a variety of sizes should be retained to provide habitat for wildlife species associated with burned habitats (see appendix C for possible strategies, since this will vary on a site-specific basis).
- When salvaging timber in areas burned by wildfire that previously met definitions of old growth, standing live, dying and dead western larch, ponderosa pine, and black cottonwood trees greater than 20 inches d.b.h should be retained to contribute to diverse forest structure for wildlife.
- When harvesting timber in white-tailed deer winter habitat mapped by MFWP (see figure B-31 or subsequent updates), sufficient live Douglas-fir and ponderosa pine trees should be retained in the uppermost canopy to contribute to snow interception during harsh winters (see appendix C for strategies, since this will vary over time on a site-specific basis).

## Other Forest Products, including Huckleberries (OFP)

## Desired Condition (FW-DC- OFP)

Provide a variety of public services and special forest products (such as mushrooms, huckleberries, firewood) from National Forest System lands while minimizing the risk of grizzly bear-human conflicts on National Forest System lands in the NCDE. See also FW-DC-WL-01

**O2** Special forest and botanical products are harvested in a sustainable manner, providing products for current and future generations. Vegetation management activities augment the firewood program providing opportunities for collecting firewood.

Berry-producing huckleberries are available for wildlife as well as human use and are harvested in a sustainable manner, providing products for current and future generations.

### Standards (FW-STD-OFP)

Special use permits for apiaries (beehives) located on National Forest System lands shall incorporate measures including approved electric fencing to reduce the risk of grizzly bear–human conflicts, as specified in the food storage order.

See also FW-STD-IFS-04.

### Guidelines (FW-DC-OFP)

Educate the public on the use of non-destructive berry harvesting methods to protect huckleberry plants and on the ethics of botanical product collection to conserve native plant populations and communities.

# Energy and Mineral Resources (E&M)

#### Introduction

The Forest Service has a minerals management mission to encourage, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on NFS lands to help meet the present and future needs of the Nation. Management of mineral and energy resources has been defined by Federal laws, regulations and legal decision. There are three types of mineral and energy resources:

- 1. Locatable Minerals: Includes commodities such as gold, silver, copper, zinc, nickel, lead, platinum, etc. and some nonmetallic minerals such as asbestos, gypsum, and gemstones. Under the Mining Law of 1872, US citizens are guaranteed the right to prospect and explore lands reserved from the public domain and open to mineral entry. The right of access for exploration and development of locatable mineral is guaranteed.
- 2. Salable Minerals: Includes common varieties of sand, stone, gravel, cinders, clay, pumice and pumicite. The Forest Service has the authority to dispose of these materials on public lands through a variety of methods. The disposal of these materials is discretionary.
- 3. Leasable Minerals: Includes commodities such as oil, gas, coal, geothermal, potassium, sodium phosphates, oil shale, sulfur, and solid leasable minerals on acquired lands. Currently there are 341 suspended oil and gas leases covering approximately 641,500 acres on the Forest. No activity can take place on the leases until an environmental impact statement is completed. A leasing decision will not be a part of this proposed action.

## Desired Condition (FW-DC-E&M)

NRLMD Objective HU 05 and 06 apply (see appendix F).

Mineral materials are available based upon public interest, in-service needs, material availability, and valid existing rights, where consistent with desired conditions for other resources

**02** Locatable minerals are available for prospecting, exploring, developing, and producing and the lands are reclaimed in an appropriate manner. Abandoned mines that present a physical or chemical hazard to humans are identified, inventoried and reclaimed in the appropriate manner.

- 03 The lands developed for minerals materials are reclaimed in the appropriate manner.
- Non-energy leasable minerals are available for prospecting, exploring, developing, and producing and the lands are reclaimed in the appropriate manner.
- **05** Energy leasable minerals are available for lease where the land is open to leasing.

### Standards (FW-STD-E&M)

- Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), mining activities (as authorized under the Mining Law of 1872) and oil and gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of 1987) occurring on NFS lands shall either avoid, minimize and/or mitigate environmental impacts to grizzly bears or their habitat, subject to existing rights. Stipulations or mitigation measures already included in existing leases, permits, or Plans of Operations on National Forest System lands shall not be changed, nor will additional stipulations or mitigation measures be added, without the lease, permit, or Plan of Operation holder's agreement.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), new or re-authorized permits, leases, and/or plans of operation shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear–human conflict situation.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), new plans of operation, permits, and/or leases for mineral activities shall include measures to reasonably mitigate potential impacts of mineral development for the following:
  - Land surface and vegetation disturbance;
  - Water table alterations;
  - Construction, operation, and reclamation of mine-related facilities such as impoundments, rights of way, motorized routes, pipelines, canals, transmission lines or other structures.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), in addition to measures included in the Food/Wildlife Attractant Special Order(s), new Plans of Operation, permits, and/or leases for mineral activities shall include the following measures regarding grizzly bear attractants:
  - Bear resistant food storage and garbage containers shall be used at development sites and at any campgrounds or dispersed sites where exploration or production-related human occupancy is anticipated;
  - Garbage shall be removed in a timely manner;
  - Road kills shall be removed daily to a designated location determined in close coordination with Montana Fish, Wildlife and Parks;
  - Feeding of wildlife shall not be allowed;

 Locations of work camps shall be approved in advance of operations. Food storage requirements shall be strictly adhered to in any work camps.

- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), if minerals activities have the potential to adversely affect grizzly bears or their habitat as determined by a site-specific analysis, new Plans of Operation, permits, and/or leases for mineral activities shall include the following mitigation measures, stipulations, or surface use criteria regarding grizzly bear habitat:
  - Ground-disturbing activities in identified grizzly bear spring habitat (as identified in a site specific biological evaluation or other environmental document) shall be avoided between April 1 and June 30. If timing restrictions are not practicable, other measures shall be taken to reasonably mitigate negative impacts of mineral activity to grizzly bears;
  - Seismic activity in identified grizzly bear denning habitat (as identified in a site specific biological evaluation or other environmental document) shall be avoided during the denning season (see glossary);
  - Cumulative impacts of multiple, concurrent seismic and/or drilling operations shall be limited
    by timing restrictions. If timing restrictions are not practicable, reasonable and appropriate
    measures shall be taken to mitigate negative impacts to the grizzly bear;
  - Reasonable and appropriate measures regarding the maintenance, rehabilitation, restoration or
    mitigation of functioning aquatic systems and riparian management zones shall identify how
    reclamation will occur, plant species to be used in reclamation, a timeframe of when
    reclamation will be completed, and monitoring criteria.
    - Reclamation and revegetation of motorized routes, drilling pads, and other areas disturbed from mineral activities shall be completed as soon as practicable by the operator.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), if mineral activities have the potential to adversely affect grizzly bears or their habitat as determined by a site-specific analysis, new plans of operations, permits, shall include the following mitigation measures regarding motorized access:
  - Public motorized use that is not associated with minerals activities shall be prohibited on motorized routes constructed for exploration and/or development;
  - A traffic management plan shall be developed as part of the proposed activity to identify when and how motorized routes will be used, maintained, and monitored (if required), and how motorized route standards and guidelines will be implemented after activities have ended;
  - Helicopter use associated with seismic activity, exploration, drilling or development must follow an approved plan or permit;
    - Speed limits shall be adopted on motorized routes if needed to prevent or reduce collisions with grizzly bears.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile Demographic Connectivity Areas), minerals contractors or lessees shall require employees to attend training related to safely living near and working in grizzly bear habitat prior to starting work, and on an annual basis thereafter.

**O8** Alternative C: Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), new oil and gas leases shall include a no surface occupancy stipulation.

**09** Mineral development is not allowed in areas withdrawn from mineral entry.

### Guidelines (FW-GDL-E&M)

NRLMD Guideline HU G4, G5 and G12 apply (see appendix F).

- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), in addition to forest-wide guidelines, the following guidelines apply to new leasable minerals activities including leases, surface use plans for proposed wells or operations, or permits to conduct seismic exploration or drilling. Helicopter use plans should:
  - Avoid establishing recurring helicopter use (see glossary), especially in spring habitats or other known important grizzly bear habitats or use areas;
  - Avoid establishing landing zones, especially in spring habitats or other known important grizzly bear habitats or use areas. If a landing zone is deemed necessary for safe implementation of the seismic or surface use plan or permit to drill, the landing zone should be constructed only in an area that has had site-specific analysis and approval.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), leasable energy activities should use the best available noise-reduction technology on equipment and motorized vehicles to reduce potential disturbance or displacement of grizzly bears, whenever possible.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), along motorized routes, seismic corridors, and pipelines constructed for leasable energy activities, wildlife cover should be maintained at regular intervals (as determined by site-specific analysis) in order to provide habitat connectivity for grizzly bears.
- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), for locatable and non-energy leasable minerals activities with the potential to adversely affect the grizzly bear or its habitat as determined by a site-specific analysis, the following tiered measures should be considered to mitigate impacts to grizzly bear habitat. Beginning at Step 1, any subsequent steps would be implemented only if the prior steps are not possible or achievable.
  - Step 1: The operator should reclaim the affected area back to suitable bear habitat that has similar or improved characteristics and qualities as the original habitat (such as the same native vegetation).
  - Step 2: If Step 1 is not attainable, operators should either acquire a perpetual conservation easement (or easements) or purchase comparable or better replacement grizzly bear habitat within the Primary Conservation Area. Acquisition of habitat within connectivity corridors could also be considered for mitigation, when appropriate. Habitat acquired for mitigation may require a purchase rate of >1:1 on an acreage basis, depending on the quality of habitat degraded and habitat available for acquisition.
  - Step 3: If Steps 1 or 2 are not achievable, the next option is to consider offsetting negative effects to bears and grizzly bear habitat with other appropriate types of actions.

Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), carrying of bear spray should be recommended to mineral permitees, leasees and operators.

- Within the NCDE primary conservation area and zone 1(including the Salish and Ninemile demographic connectivity areas), available resources at existing gravel pits should be used before constructing new pits.
- Minimize adverse effects to inland native fish species from mineral operations. All proposed mineral operations should avoid RMZs. If the RMZ cannot be avoided, then ensure operators take all practicable measures to maintain, protect, and rehabilitate fish and wildlife habitat which may be affected by the operations. Required bonding must consider (in the estimation of bond amount) the cost of stabilizing, rehabilitating, and reclaiming the area of operations.
- Adverse effects to aquatic and other riparian associated resources from mineral operations should be minimized or avoided. For operations in a riparian management area ensure operators take all practicable measures to maintain, protect, and rehabilitate water quality, and habitat for fish and wildlife and other riparian associated resources which may be affected by the operations.

## Livestock Grazing (GR)

### Desired Condition (FW-DC-GR)

NRLMD Objective GRAZ 01 applies (see appendix F).

- Alternative B and D: Within the NCDE primary conservation area, the number, capacity of, and improvements on cattle and sheep grazing allotments support ecologically sustainable grazing, and temporary grazing permits are used effectively for management of noxious weeds, while minimizing the risk of human-bear conflicts on NFS lands. See also FW-DC-WL-01 and FW-DC-WL-02.
  - Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), the number, capacity of, and improvements on cattle and sheep grazing allotments support ecologically sustainable grazing, and temporary grazing permits are used effectively for management of noxious weeds, while minimizing the risk of human-bear conflicts on National Forest System lands. See also FW-DC-WL-01 and FW-DC-WL-02.
- **O2** Existing cattle-grazing allotments help preserve the rural landscape and cultural heritage of the area, while sustaining biological diversity and ecological processes.
- Management of domestic livestock grazing maintains the desired species composition, structure, and the condition of plant communities. Regeneration of forests and biological diversity is not limited by livestock grazing. Forage, browse, and cover needs of wildlife and authorized livestock are in balance with available forage.
- Transitory forage on forest lands is available for cattle grazing within existing, permitted allotments.
- **05** Dispersed grazing is available for use by pack stock.

### Standards (FW-STD-GR)

Alternative B and D: Within the NCDE primary conservation area, issuance of new permits and reauthorization of existing allotments and Annual Operating Plans shall incorporate measures to reduce the risk of grizzly bear–human conflicts. New or re-authorized permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear–human conflict situation.

Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), issuance of new permits and reauthorization of existing allotments and annual operating plans shall incorporate measures to reduce the risk of grizzly bear–human conflicts. New or re-authorized permits shall include a clause providing for modification, cancellation, suspension, or temporary cessation of activities, if needed, to resolve a grizzly bear–human conflict situation.

- Alternative B and D: Within the NCDE primary conservation area, a grazing permit in non-use status shall not be allowed to increase allowable animal unit months when returning to use.
  - Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), a grazing permit in non-use status shall not be allowed to increase allowable animal unit months when returning to use.
- Alternative B and D: Within the NCDE primary conservation area, permits for livestock grazing shall include a provision that requires reporting livestock carcasses within 24 hours of discovery, which shall be followed by proper disposal of the carcass. Boneyards shall not be established on NFS lands.
  - Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), permits for livestock grazing shall include a provision that requires reporting livestock carcasses within 24 hours of discovery, which shall be followed by proper disposal of the carcass. Bone yards shall not be established on NFS lands.
- Alternative B and D: Within the NCDE primary conservation area, there shall be no increase in the number of active sheep allotments or in permitted sheep animal unit months above the baseline (see glossary) on NFS lands. Allowable animal unit months shall not be increased for inactive allotments. Note: Existing allotments may be combined or divided as long as it does not result in grazing allotments in currently un-allotted lands or an increase in AUMs. *Note: the Flathead National Forest does not currently have any sheep allotments*.
  - Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), there shall be no increase in the number of active sheep allotments or in permitted sheep animal unit months above the baseline (see glossary) on NFS lands. Allowable animal unit months shall not be increased for inactive allotments. *Note*: Existing allotments may be combined or divided as long as it does not result in grazing allotments in currently un-allotted lands. *Note: the Flathead National Forest does not currently have any sheep allotments*.
- Within the NCDE primary conservation area, there shall be no increase in the number of active cattle grazing allotments above the baseline (see glossary) on NFS lands. Note: Existing allotments may be combined or divided as long as that does not result in grazing allotments in currently unallotted lands.

Of Alternative B and D: Within the NCDE primary conservation area, temporary permits for grazing by small livestock for purposes such as controlling invasive exotic weeds or reducing fire risk, or for trailing of small livestock across National Forest System lands, shall include one or more measures to reduce the risk of grizzly bear–human conflicts. Such activities shall not result in an increase in bear/small livestock conflicts or in removal of grizzly bears due to such conflicts. If grizzly bear conflicts arise, the livestock, rather than the grizzly bear, shall be removed. Exceptions to this standard include: operations which use livestock for packing purposes; outfitter and guide permits.

Alternative C: Within the NCDE primary conservation area and zone 1 (including the Salish and Ninemile demographic connectivity areas), temporary permits for grazing by small livestock for purposes such as controlling invasive exotic weeds or reducing fire risk, or for trailing of small livestock across National Forest System lands, shall include one or more measures to reduce the risk of grizzly bear–human conflicts. Such activities shall not result in an increase in bear/small livestock conflicts or in removal of grizzly bears due to such conflicts. If grizzly bear conflicts arise, the livestock, rather than the grizzly bear, shall be removed. Exceptions to this standard include: operations which use livestock for packing purposes; outfitter and guide permits.

- **07** Grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that adversely affect fish and riparian habitat will be modified.
- New livestock handling and/or management facilities will be located outside of RMZs. New areas for livestock trailing, bedding, watering, salting, loading, and other handling or management efforts will be limited to those areas and times that would not adversely affect listed animal and plant species or animal and plant species of conservation concern.

## Guidelines (FW-GDL-GR)

NRLMD Guideline GRAZ G1 through G4 apply (see appendix F).

- Within the NCDE primary conservation area, where recurring grizzly bear–human conflicts occur on sheep or cattle allotments and an opportunity exists with a willing permittee, the Forest Service should consider phasing out grazing or moving the livestock to a vacant allotment where there is less likelihood of grizzly bear–human conflicts.
  - Alternative C: Within the NCDE Primary Conservation Area, where recurring grizzly bear–human conflicts occur on sheep or cattle allotments and an opportunity exists with a willing permittee, the Forest Service should phase out grazing or move the livestock to a vacant allotment where there is less likelihood of grizzly bear–human conflicts. See also NCDE-STD-GRZ-07.
- Within the NCDE primary conservation area, an allotment management plan and plan of operations should specify any needed measures to protect key grizzly bear food production areas (e.g., wet meadows, stream bottoms, aspen groves, and other riparian wildlife habitats) from conflicting and competing use by livestock, as determined by a site-specific analysis.
- Ouring allotment management planning, consider adjusting grazing practices (e.g. length of grazing season, stocking levels, timing of grazing, etc.) to minimize impacts that are inconsistent with riparian management desired conditions.
- **04** Livestock trailing, bedding, watering, salting, loading, and other handling activities should be avoided in RMZs.

05 To reduce bank trampling of perennial vegetation on or near the water's edge (e.g. greenline):

- do not exceed 20% streambank alteration;
- do not exceed 40% utilization of mean annual vegetative production on woody vegetation;
- maintain at least 4-6 inches or do not exceed 40% utilization of mean annual vegetative production on herbaceous vegetation

## Economic and Social (S&E)

### Desired Condition (FW-DC-S&E)

Ecological sustainability provides a variety of benefits that contribute to community stability and the quality of life in nearby communities and the larger population such as clean water, forest products, livestock grazing, carbon sequestration, energy generation, recreational opportunities, aesthetics, cultural uses, and habitat for biodiversity in the forest. Vegetation conditions support the long term sustainability of these benefits to people by reducing the risk of undesirable fire effects, disease and mortality, which may interrupt or eliminate forest benefits.

- O2 Sustainable and predictable levels of goods and services (such as wilderness hunting and fishing opportunities, timber, downhill skiing, and huckleberries) are provided for local communities that contribute to the local economy through the generation of jobs and income while creating products for use, both nationally and locally.
- Ample opportunities, including employment, to connect people, including youth, with nature exist across the Forest.

# Partnerships and Coordination (P&C)

## Desired Conditions (FW-DC-P&C)

- Work towards an all-lands approach to management, cooperating with other land managers, including efforts to mitigate threats or stressors, provide for wildlife and fish habitat connectivity, and to provide social, economic and ecological conditions that contribute to mutual objectives.
- O2 Cooperation and coordination with state agencies, federal agencies, tribes, counties and other groups lead to a stable or an upward trend of native fish and wildlife species and desired non-native aquatic and terrestrial species.
- Recovery of threatened and endangered species is accomplished through cooperation with the U.S. Fish and Wildlife Service (including section 7 consultation, as required), state agencies, other federal agencies, tribes, counties, interested groups, and interested private landowners.
- O4 Coordination with Montana Fish, Wildlife and Parks and USFWS in managing the wildlife resource within designated wilderness protects the wilderness character.
- Partnerships with federal and non-federal entities helps achieve desired conditions and improve overall resources management. Partnerships and/or collaborative processes within the local communities fosters relationships that help accomplish projects in the communities' and Forest's shared interest.
- **06** Federal, state, county, and tribal agencies, universities, non-governmental organizations, and private landowners will have the opportunity to participate in development, implementation, maintenance, and/or monitoring efforts.
- The Forest and potential partners would have an expressed mutual interest in, benefit from, and understanding of a common purpose(s) that helps achieve their respective missions.
- **08** Partnerships and projects would be widely recognized by the public as beneficial to resource management, and as an appropriate and efficient use of Forest Service cooperative efforts and funding.

**09** Partnerships arrangements would be transparent to the public and free of real or apparent conflicts of interest, or endorsement of commercial products, services, or entities.

- Partner with local groups to develop a recreational trail infrastructure (e.g. hut-to-hut system) where compatible with other resources.
- Partner with agencies, organizations and support groups to maintain the Forest Backcountry Administrative Facilities Historic District on the forest.
- 12 Coordinate with scientists from Rocky Mountain Research Station on the effects of climate change.
- 13 Federal, state, county, and tribal agencies, universities, local schools, non-governmental organizations, and private landowners will have the opportunity to participate in cooperative partnerships to support a quality educational program and program delivery.
- 14 Work towards an all-lands approach to management of species of conservation concern, cooperating with other land managers across the range of a species, including efforts to provide for habitat connectivity, mitigate threats or stressors, and to provide other ecological conditions that would support the species.
- Bull trout population trends toward recovery through cooperation and coordination with USFWS, tribes, state agencies, other federal agencies, and interested groups. Recovery is supported through the Bull Trout Conservation Strategy and the Bull Trout Recovery Plan.
- 16 Cooperation and coordination occurs with adjacent landowners to identify and manage non-native invasive weeds.

## Cultural and Historical Resources (C&HR)

# Desired Conditions (FW-DC-C&HR)

- Oultural resources (e.g., buildings, sites, districts, structures, and objects) having scientific, cultural, or social values are preserved and protected for their cultural importance. Removal of a cultural resource may occur after site specific review and consultation with the State Historic Preservation Office. Site integrity and stability is protected and maintained on sites that are susceptible to imminent risks or threats, or where the values are rare or unique. Heritage assets are stable and their significant values protected. Vandalism, looting, theft, and human-caused damage to heritage resources are rare. Site significance and integrity are maintained through conservation and preservation efforts and receive minimal impact from visitors.
- Traditional cultural properties, cultural landscapes, sacred sites, and other culturally significant areas identified by tribes and local communities provide tangible links to historically rooted beliefs, customs, and practices. These resources are protected through consultation with American Indian tribes, traditional cultural practitioners, consulting parties, and project design.
- Oultural resources provide educational opportunities that connect people, past and present, to the land and its history. Through positive heritage experiences provided by interpretive sites, historic standing structures and other materials, the public has an appreciation for the region's history and develops an awareness of preservation efforts. In some cases, historic routes (e.g., railroad grades) are used for recreation trails with interpretation of their history and some historic features. Heritage-based recreation opportunities are connected, where practical, with other recreation opportunities such as trails.

Public enjoyment is enhanced by opportunities to visit interpretive cultural resource sites. Archaeological research contributes to knowledge about ancient American Indian history and provides a valuable perspective on past climate and environment. Archaeological site etiquette information is readily available to national forest visitors. Interpretation of the human history of the forest promotes greater public understanding of the communities that have depended on this landscape for their livelihood, recreation and spiritual wellbeing.

- Opportunities exist for volunteers to participate in cultural resource conservation activities such as research, site stabilization, conservation, and interpretation. Cultural resource programs, interpretive presentations, or publications are available to provide the public with opportunities to learn about, understand and experience the forest's past.
- Of Sites identified as significant, under the National Historic Preservation Act, are inventoried, protected, and, if warranted, nominated to the National Register of Historic Places. Restored historic buildings placed on the Forest Service facility rental program add to forest recreation program capacity and diversity and generate revenue. Historic Forest Service administrative buildings are maintained to reflect agency history, identity, and function.

### Objectives (FW-OBJ-C&HR)

- Annually complete an inventory of 50 to 100 acres containing, or predicted to contain, highly valuable, threatened, or vulnerable cultural resources (non-project acres).
- Evaluate and nominate four to eight significant cultural resources to the National Register of Historic Places or develop five historic contexts, overviews, thematic studies, or cultural resources property preservation plans to help guide management and use of National Register eligible or listed properties, districts, traditional cultural properties, and cultural landscapes.
- Annually complete one public outreach or interpretive project that enhances public understanding and awareness of cultural resources and/or history of the plan area.

## Guidelines (FW-GDL-C&HR)

To protect cultural resources, provisions should be included in applicable contracts, agreements, and special use permits for National Register-listed or eligible properties.

# Areas of Tribal Importance (TRIB)

## Desired Condition (FW-DC-TRIB)

- O1 The Forest recognizes and maintains culturally significant species and the habitat necessary to support healthy, sustainable, and harvestable plant and animal populations to ensure that rights reserved by Tribes are not significantly impacted or diminished.
- The Forest recognizes, ensures, and accommodates tribal member access to the Forest for the exercise of treaty rights and to provide opportunities to practice traditional, cultural, and religious activities, such as plant gathering and ceremonial activities that are essential to sustaining their way of life, cultural integrity, social cohesion, and economic well-being.

## Objectives (FW-OBJ-TRIB)

Management of traditional cultural areas, through the development of two to five management plans, in consultation with the tribes.

Ongoing government-to-government and staff consultation for each federally recognized Tribe with historical or treaty interests in Flathead NFS land, through a cooperatively established tribal consultation protocol.

### Guidelines (FW-GDL-TRIB)

01 To protect treaty rights and cultural sites and cultural use, consult with Tribes according to the consultation protocol.

# Research and Education (R&E)

### Desired Conditions (FW-DC-R&E)

- 11 Interpretation and education opportunities enrich the visitor's experience and understanding of the Forest, e.g. wildlife-human conflicts and reduction, and information about of aquatic and terrestrial invasive species.
- O2 Conservation education interpretive and visitor information programs provide opportunities for visitors, youth, and communities to appreciate and understand the Forest's natural and cultural resources and learn how to conserve those resources for future generations.
- Education, interpretive and information programs and activities connect people to the forest environment and foster a sense of place and stewardship.
- **04** Focused education activities engage youth in hands-on outdoor experiences and support educators in teaching science and natural resource topics.
- O5 Diverse methods and media are used for program delivery including making best use of new technologies to help maintain audience relevancy in the areas of social media, web/internet presence, self-guided media using smart phones and other devices.
- Research and subsequent results continues to provide information and guide management about ecological, social, and economic conditions across the landscape.

# Chapter 3. Management Area Direction

# Introduction

The NFS land within the Forest boundary has been divided into seven broad management areas and further subdivided into 16 specific management areas, each with a different emphasis which is intended to direct management activities on that particular piece of land. Management area allocations are specific to areas across the Forest with similar management needs and desired conditions.

This chapter includes a description of the management areas, acres allocated, and management direction in the form of desired conditions, standards, guidelines, and suitability of lands. If there are differences by action alternative in either allocation of acres or plan component direction, these are indicated when applicable.

The management area categories are in table 24 below. Management areas by geographic area are included in chapter 4 and the corresponding maps are figures B-32 through B-49.

Table 24. Management areas (MAs) by alternative

Code	Management Area Category
1a	Designated Wilderness
1b	Recommended wilderness
2a	Designated wild and scenic rivers
2b	Eligible wild and scenic rivers
3a	Administrative areas
3b	Special areas
4a	Research natural areas
4b	Experimental and demonstration forests
5a	Non-motorized year-round
5b	Motorized year-round (motorized vehicle use only designated roads, trails, and areas)
5c	Motorized over-snow vehicle opportunities (on designated routes and areas)
5d	Summer motorized (wheeled vehicle use on designated roads, trails, and areas)
6a	General forest low
6b	General forest medium
6c	General forest high
7	Focused recreation areas

Management area desired conditions are indications of what future conditions would typically be desired in each management area. They help clarify the general suitability of various parts of the forest for different activities and management practices (management area desired conditions are part of the "suitability of areas" component in chapter 2). These desired conditions help us clarify what outcomes might be expected in land areas with different general suitability descriptions. Suitability is discussed by management area and summarized at the end of this chapter.

# MA 1: Wilderness

#### Introduction

These areas are managed to protect wilderness character as defined in the Wilderness Act.

# 1a Designated Wilderness

## **Background**

The Forest contains 1,069,933 million acres of designated wilderness, which accounts for about 45 percent of the forest. There are three designated wilderness areas within the Forest – the Bob Marshall, the Great Bear and the Mission Mountains Wilderness areas. These wilderness lands provide hiking, hunting, fishing, and horseback riding at the primitive end of the spectrum.

The Mission Mountains Wilderness is adjacent to the Mission Mountains Tribal Wilderness to the west, which is managed by the Confederate Salish and Kootenai Tribes. This area is managed to protect wilderness character as defined in the Wilderness Act and outlined in the Mission Mountains Wilderness Management Plan.

The Bob Marshall, Great Bear and Scapegoat (not on the Forest) wilderness areas comprise the Bob Marshall Wilderness Complex (BMWC) which makes up an area more than 1.5 million acres. Management responsibility for the BMWC is shared with the Lolo, Lewis and Clark and Helena NF. This area is managed to protect wilderness character as defined in the Wilderness Act and outlined in the Bob Marshall, Great Bear, Scapegoat Wildernesses Recreation Management Direction.

Table 25: Designated wilderness areas on the Forest

Name	Acres <sup>a</sup>
Bob Marshall	712,331
Great Bear	286,872
Mission Mountains	76,173

a. Acres are from GIS dataset and analyses. The official acres for wilderness areas can be found in the land area report, <a href="http://www.fs.fed.us/land/staff/lar-index.shtml">http://www.fs.fed.us/land/staff/lar-index.shtml</a>.

# **Desired Conditions (MA1a-DC)**

- Wilderness areas are managed to provide for wilderness character as defined by the Wilderness Act and the wilderness areas' enabling legislation. Wilderness character, as described in the Wilderness Act, can be defined through five qualities which are: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features of value such as ecological, geological, scientific, scenic, or historic.
- Natural ecological processes and disturbance (e.g., succession, wildfire, avalanches, insects, and disease) are the primary forces affecting the composition, structure, and pattern of vegetation. Wilderness areas provide opportunities for visitors to experience natural ecological processes and disturbances with limited amount of human influence.
- Facilities in the Bob Marshall and Great Bear Wilderness areas provide for the management, protection and use of the wilderness.

Non-native invasive species are non-existent or in low abundance and do not disrupt ecological functions

- The current trails system in the Bob Marshall, Mission Mountains, and Great Bear Wilderness areas on the Forest is managed to provide for wilderness experience.
- Existing outfitter and guide service opportunities are maintained in the Bob Marshall Wilderness Complex as determined by identified public need.
- **07** Schafer Meadows Airstrip serves as an airplane accessible trailhead.
- The Bob Marshall and Mission Mountains Wilderness areas are Class I Air Quality areas and managed as such; the Great Bear Wilderness area is managed as a Class II area.

#### Standards (MA1a-STD)

- Do not authorize group sizes in excess of 15 people, and 35 head of livestock per party within the Bob Marshall and Great Bear Wilderness areas.
- O2 Do not authorize group sizes in excess of eight people and eight head of livestock per party within the Mission Mountains Wilderness.
- **03** Permanent structures for the administration of the Mission Mountains Wilderness shall not be built.
- O4 Do not maintain, rehabilitate, restore, or interpret cultural resources within the Mission Mountains Wilderness.

# **Guidelines (MA1a-GDL)**

- To protect water quality and aquatic habitat, RMZ tethering and grazing of recreational stock should be beyond 100 feet of lakeshores.
- To protect the social and ecological conditions within the Flathead National Forest portion of the Bob Marshall Wilderness Complex, additional outfitter and guide permits use levels should not be issued nor should approval be granted to expand operations beyond 17,953 days for the Flathead National Forest service day use in all seasons of the 30,000 service days authorized across the BMWC.

#### **Suitability (MA1a-SUIT)**

- **01** Designated wilderness areas are not suitable for motorized uses or mechanized transport except as allowed by enabling legislation.
- Wilderness areas are not suitable for timber production or timber harvest
- Wilderness areas are not suitable for commercial use of non-timber forest products (e.g., firewood, mushrooms, huckleberries), but are suitable for personal and agency use.

#### 1b Recommended Wilderness

#### **Description**

Recommended wilderness lands are lands that have the potential to become designated as official wilderness through legislation. The Forest Service only recommends these lands to the United States

Congress for consideration. Congress, and ultimately the President, must establish legislation (through a Wilderness Bill) to officially designate wilderness areas.

Refer to the DEIS, appendix 1c for the specific areas and maps being recommended by alternative as additions to the National Wilderness Preservation System. The total area by alternative is shown in table 26.

Table 26. Total approximate acres of recommended wilderness areas<sup>a</sup> to the National Wilderness Preservation System

Recommended wilderness	Alt A	Alt B	Alt C	Alt D
Total Acres	98,388	187,741	506,919	0

a. See appendix 1c: Evaluation of Wilderness Inventory Areas

#### **Desired Conditions (MA1b-DC)**

- **01** Recommended wilderness areas preserve opportunities for inclusion in the National Wilderness Preservation System. Maintain and protect the ecological and social characteristics that provide the basis for each area's suitability for wilderness recommendation.
- **02** Recommended wilderness areas are characterized by a natural environment where ecological processes such as natural succession, wildfire, avalanches, insects, and disease function with limited amount of human influence. Impacts from visitation do not detract from the natural setting.
- The Jewel Basin Hiking Area portion of the Jewel Basin Recommended Wilderness Area provides a recreation experience without motorized, mechanical transport, or stock use.

## Standard (MA1b-STD)

- 01 Commercial communication sites shall be located outside of recommended wilderness areas.
- Do not authorize motorized over-snow vehicles use, wheeled motorized, mechanical, and stock use and transport in the Jewel Basin Hiking Area portion of the Jewel Basin recommended wilderness.

#### **Guideline (MA1b-GDL)**

- To maintain the wilderness character, other agency communication sites for public safety should be located outside of recommended wilderness unless no other alternative is available. If they have to be located in recommended wilderness, they should blend with the environment, and be located away from system trails and developed sites.
- To protect wilderness character and cave resources, wilderness caves should not be signed, disclosed on maps, mentioned in brochures, or have permanent reference marking except when necessary for resource protection.

## **Suitability (MA1b-SUIT)**

**01** Public mechanized transport and motorized use:

Alternative B: Existing mechanized transport, and motorized travel and uses, for example use of mountain bikes, are allowed to continue if such uses do not prevent the protection and maintenance of the social and ecological characteristics that provide the basis for wilderness designation.

Alternative C: Mechanized transport, and motorized travel and uses are not suitable.

Jewel Basin Recommended Wilderness Area is suitable for existing outfitting and guiding but not suitable for additional outfitting and guiding or large group events. Recommended wilderness areas adjacent to the Bob Marshall and Great Bear wilderness areas are suitable for outfitter guide services.

- 03 Recommended wilderness is not suitable for timber production and timber harvest is not allowed.
- **04** Recommended wilderness areas are suitable for commercial or non-commercial use of non-timber forest products (e.g., mushrooms, huckleberries) as long as the social and ecological characteristics that provide the basis for wilderness designation are maintained and protected.
- **05** Recommended wilderness is not suitable for new commercial communication sites.
- Recommended wilderness is suitable for restoration activities where the outcomes will protect the wilderness characteristics of the areas as long as the ecological and social characteristics that provide the basis for each area's suitability for wilderness recommendation are maintained and protected.
- **07** Recommended wilderness is not suitable for road construction or reconstruction.
- **08** Recommended wilderness is not suitable for developed recreation facilities that provide for user comforts such as picnic tables, fire grills, and vault toilets.

# MA 2: Wild and Scenic Rivers

#### Introduction

This management area applies to river segments that are either designated or eligible for inclusion as part of the wild and scenic river system under the authority granted by the Wild and Scenic Rivers Act of 1968, as amended.

For wild and scenic rivers, the designated management boundaries generally consist of an area that averages one-quarter-mile-wide on either bank to protect river-related values.

Wild and scenic river segments are classified as wild, scenic, or recreational.

- Wild River Segment Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- Scenic River Segment Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational River Segment Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

#### **Desired Conditions (MA2-DC)**

- 01 The free-flowing character of designated wild and scenic rivers is maintained.
- **02** Outstandingly remarkable values of the designated river area are protected.
- **02** Designated or eligible wild rivers are free of impoundments and generally inaccessible except by trail, with watersheds or shoreline essentially primitive and waters unpolluted.
- O3 Designated or eligible scenic rivers are free of impoundments, with shoreline or watersheds still largely primitive and undeveloped but accessible in places by roads.
- Designated or eligible recreational rivers are accessible by road or railroad, may have some shoreline development and may have had an impoundment or diversion in the past.
- 05 Retain federal lands within the wild and scenic river corridor in public ownership.
- **06** Administrative facilities are screened or designed to blend into the natural river environment.
- O7 Commercial outfitted river use is a key element in providing guided fishing and rafting experience on the Flathead Wild and Scenic River.

#### Standards (MA2-STD)

- Wilderness management direction must be followed where segments of the Flathead Wild and Scenic River (portion of the South and Middle Fork of the Flathead) are located in the wilderness.
- **02** Designated rivers must be managed to protect the free-flowing character and outstandingly remarkable values for which it was designated.

## Guideline (MA2-GLD)

To protect the outstandingly remarkable values, impacts from recreational use should be in the acceptable range per direction in Flathead River Wild and Scenic Recreation Direction.

# 2a Designated Wild and Scenic River

#### **Description**

The Forest has one designated wild and scenic river, the Flathead River, which has three forks: the South Fork, Middle Fork, and North Fork that were designated by Congress in 1976 for a total of 219 miles. Table 27 lists the outstandingly remarkable values, miles, and acres of designated wild and scenic rivers. These rivers are managed to protect the outstandingly remarkable values identified for each river as defined in the Wild and Scenic River Act and outlined in the Flathead Wild and Scenic River Management Plan (1980) and the Flathead River Wild and Scenic Recreation Direction (1986).

Table 27. Outstandingly remarkable values, miles, and acres of designated Wild and Scenic River (WSR)

Designated WSR	Outstandingly Remarkable Values	Milesa	Acresb
Middle Fork Flathead River	Wild section: fisheries, geology, water quality, wildlife, botany, recreation, scenic, historic, ethnographic.  Recreation segment: fisheries, geology, water quality, wildlife, recreation, scenic, history	96	19,498
North Fork Flathead River	Scenic section: fisheries, geology, water quality, wildlife, botany, recreation, scenic, historic, ethnographic.  Recreation section: fisheries, geology, water quality, wildlife, recreation, history	59	6,178
South Fork Flathead River	Wild/wilderness section: fisheries, geology, water quality, wildlife, botany, recreation, scenic, historic, ethnographic.  Wild/non-wilderness section: fisheries, geology, water quality, wildlife, recreation, scenic, historic, ethnographic.  Recreation section: fisheries, geology, water quality, wildlife, recreation, scenic, historic, ethnographic.	61	16,498

a. Miles are approximate

#### Suitability (MA2a-SUIT)

- Wild river corridors are not suitable for timber production, for commercial use of non-timber forest products, and timber harvest is not allowed.
- **02** Scenic and recreational river corridors are not suitable for timber production; however, timber harvesting for other multiple-use purposes, for salvage logging, and to achieve desired vegetation conditions could occur.
- **03** Scenic corridors are suitable for non-commercial (personal) use of non-timber forest products.
- **04** Recreational rivers corridors are suitable for the commercial and non-commercial (personal) use of non-timber forest products.
- **05** Scenic and recreational river segments are suitable for commercial communication sites or utility corridors. The scenic section of the North Fork of the Flathead is not suitable for utility corridors.
- Wild river corridors outside of designated wilderness (section of the South Fork of the Flathead) are suitable for mechanized equipment (e.g. but not limited to mechanical transport and battery operated pumps).

b. Designated wild and scenic river acres overlapping with designated wilderness total 24,551 acres.

**07** Scenic and recreational river corridors are suitable for wheeled motorized travel on designated routes.

**08** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# 2b Eligible Wild and Scenic Rivers

A total of 273 miles of rivers within NFS lands have been identified as eligible wild and scenic rivers in the proposed action (table 28). For more information about rivers identified as eligible for wild and scenic classification refer to appendix 1d of the DEIS.

Table 28. Eligible wild and scenic rivers

River	Segment	Potential Classification	Outstandingly Remarkable Values	Length (miles)	Acres
Aeneas	Headwaters to Hungry Horse Reservoir	Scenic	History, prehistory, recreation, scenery	5	1,770
Big Salmon	Lena Lake to South Fork of Flathead River, includes Big Salmon Lake.	Wild	Recreation, geology, fish, prehistory	19	4,727
Clack Creek	Headwaters to Middle Fork of Flathead River	Wild	Geology, scenery	8	2,021
Danaher	Headwater to Youngs Creek.	Wild	Scenery, recreation, fish, wildlife, history, prehistory, botany, natural areas	23	6,042
Elk	Headwaters to forest boundary	Scenic	Fish	10	2,636
Gateway	Headwater to Strawberry Ck	Wild	Scenery, geology, history	5	1,745
Glacier	Headwaters to outlet of Glacier Slough	Wild: within Mission Mountains Wilderness; Scenic: wilderness boundary to outlet of Glacier Slough	Geology, wildlife, scenery	6	1,774
Graves	Headwaters to Hungry Horse Reservoir	Wild: within Jewel Basin; Scenic: from boundary of Jewel Basin to Hungry Horse Reservoir	Prehistory	10	2,465c
LeBeau	Headwater to LeBeau RNA boundary	Wild	Scenic, geological, natural area	4	1,325
Lion	Source to Lion Creek TH	Scenic	Wildlife	11	3,315
Little Salmon	Headwater to South Fork of Flathead River	Wild	Scenery, fish, prehistory	19	5,513
Logan	From Rd 539 to Tally Lake	Recreation	Scenic, recreational	4	1,274
Schafer	Headwaters to Middle Fork of Flathead River	Wild	Prehistory, history	11	2,947

River	Segment	Potential Classification	Outstandingly Remarkable Values	Length (miles)	Acresa
Spotted Bear	Headwater to South Fork of Flathead River	Wild: headwaters to end of Blue Lake Recreation: Blue Lake to SF of Flathead	Recreation, wildlife, geology	35	10,260
Strawberry	Headwaters to Middle Fork of Flathead River	Wild	Wild Fish 14		3,869
Lower Swan River	Swan River State Forest to Swan Lake	Recreation	Wildlife	11	1,432
Upper Swan River	From headwaters to confluence of Lindbergh	Wild	Recreation	2	
Whale	Headwaters to FS boundary	Scenic: Headwaters to confluence to Shorty Creek; Recreation: Shorty Creek to FS boundary	Wildlife	21	6,263
White River	White River	Wild	Geology, fish, history, prehistory, scenery	24	6,964
Yakinikak Trail Nokio		Scenic	Fish, prehistory, geology, wildlife	8 2 3	4,466
Youngs	Headwaters to South Fork of the Flathead	Wild	Fish, recreation, prehistory, history, scenery	23	6,462

a. There are 46,204 acres of MA2b within MA1a, 11,479 acres in MA1b, and 1,325 acres in MA 4a.

# **Desired Conditions (MA2b-DC)**

- **01** The free-flowing character of eligible wild and scenic rivers is maintained.
- **02** Outstandingly remarkable values of the identified river area are protected.
- Eligible wild river segments are free of impoundments and generally inaccessible except by trail, with watersheds or shoreline essentially primitive and waters unpolluted.
- Eligible scenic river segments are free of impoundments, with shoreline or watersheds still largely primitive and undeveloped but accessible in places by roads.
- Eligible recreational river segments are accessible by road or railroad, may have some shoreline development and may have had an impoundment or diversion in the past.

# Suitability (MA2b-SUIT)

- Eligible wild river segments are not suitable for timber production and timber harvest is not allowed.
- **02** Eligible scenic and recreational river segments are not suitable for timber production; however, timber harvesting for other multiple-use purposes, for salvage logging, and to achieve desired vegetation conditions could occur.
- Eligible scenic and recreational rivers segments are suitable for the commercial and noncommercial (personal) use of non-timber forest products.

**04** Eligible scenic and recreational river segments are suitable for commercial communication sites or utility corridors.

- **05** Eligible wild river classification segments outside of designated wilderness (Le Beau Creek) are suitable for mechanized transport.
- **06** Eligible scenic and recreational river classification segments are suitable for wheeled motorized travel on designated routes and areas.
- **07** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# MA 3: Special or Administrative Area

## Introduction

Located across the Forest, these special places have unique, unusual or important characteristics. They are administratively designated areas. Special areas are managed for public use and enjoyment to protect and conserve the values for which they were identified. Administrative areas are areas designated as necessary for the administration of duties associated with management on NFS land.

# 3a Administrative Areas

Administrative areas are facilities and infrastructure, typically buildings and their appurtenance, necessary to support the employees, equipment and activities necessary for the administration and management of the national forests. Refer to table 29 for administrative sites on the Forest.

Table 29. Administrative sites on the Forest

GA	Site Name	Acres <sup>a</sup>	GA	Site Name	Acresa
	Ranger Stations (RS)			Communication Site – Commercial	
НН	Hungry Horse RS*	202	NF	Big Mountain	1
SF	Spotted Bear RS*	170	НН	Desert Mountain	1
SV	Old Condon RS (historical)	13	SM	Blacktail	17
SM	Swan Lake RS*	15		Communication Site – FS Admin.	
	Work Centers		NF	Mount Hefty	<1
НН	Coram	355	NF	Werner Peak	<1
НН	Betty Creek (historical)	7	НН	Mount Baptiste	<1
MF	Fielding (historical)	14	MF	Patrol Ridge	<1
MF	Schafer Meadows	7	SF	Stony Hill	<1
SF	Big Prairie	70	SV	Elbow	1
SV	Condon*	10	SV	Mount Aeneas	<1
SM	Tally Lake (historical)	13	SV	Napa	1
	Guard Stations	3	SM	Ashley Mountain	<1
NF	Nasukoin Lake (historical)	<1	SM	Big Mountain	1
NF	Ninko	1	SM	Kerr Mountain	1
NF	Whale Lake (historical)	<1		Silviculture	
НН	Crevice Cabin	<1	NF	Elelehum Test Plantation	12
MF	Challenge Cabin	3	NF	Mud Lake Test Plantation	14
MF	Gooseberry Park	2	НН	Firefighter Test Plantation	8

GA	Site Name	Acresa	GA	Site Name	Acresa
MF	Granite Creek	1	SV	Bigfork Tree Improvement*	92
MF	Sabido	1	SV	Cold Ridge Test Plantation	27
MF	Spruce Park	2	SV	Condon Test Plantation	78
SF	Basin	4	SV	Weed Hill Test Plantation	7
SF	Black Bear	2	SM	Plume Creek Test Plantation	18
SF	Danaher	1		Miscellaneous	
SF	Hahn	2	NF	China Basin (historical)	<1
SF	Pendant	1	NF	Coal Ridge Cabin (historical)	1
SF	Pentagon	1	NF	Funk Schoolhouse	<1
SF	Salmon Forks	45	NF	Kintla Ranch	3
SF	Shaw	2	NF	Moose Creek Cabin (historical)	<1
SV	Elbow (historical)	<1	SF	East-side Cable Car over South Fork (USGS permitted)	<1
SV	Swan Lake	<1	SF	Upper Big Bill admin. trailhead	1
SV	Trinkus Cabin	<1	SF	West-side Cable Car over South Fork (USGS permitted)	<1
SV	Upper Holland Lake	1	SV	Jewel Basin Camp Misery cabin	<1
SM	Star Meadows	4	SV	Owl Creek Packer Barn	<1
	Fire Lookouts		SM	Kalispell Maintenance Shop	2
NF	Coal Ridge (historical)	1		Snowtel & snow monitoring sites	
NF	Cyclone	4	НН	2 sites	<1
NF	Thoma	5	MF	1 site	<1
НН	Baptiste	3	SF	2 sites	1
НН	Firefighter	8	SV	5 sites	<1
MF	Red Plume Mountain (historical)	<1	SM	7 sites	1
SF	Jumbo Mountain	<1		Gravel pits, quarries, borrow sources	
SF	Limestone	<1	NF	12 sites	27
SF	Mud Lake Mountain	<1	НН	14 sites	35
SF	Spotted Bear	2	MF	4 sites	11
SV	Cooney	1	SF	3 sites	14
SV	Holland	<1	SV	13 sites	43
	Airstrips		SM	33 sites	68
MF	Schafer	33		TOTAL Administrative Areas ACRES	1,592
SF	Meadow Creek	32			
SF	Spotted Bear	37			

<sup>\*</sup>site is mapped in the GIS dataset.

# **Desired Conditions (MA3a-Admin-DC)**

O1 Administrative facilities serve land management needs and purposes of the forest in a sustainable, economical and cost effective manner. The size, number, and location of facilities meet management needs; are affordable, safe, and energy efficient; and meet all applicable accessibility standards and guidelines. Existing facilities are included in a current, facilities master plan and consistent with direction in Built Environment Image Guide.

a. Total acres are more than in the GIS dataset where only the \*sites are mapped.

Airstrips serve the land management and public needs and purpose of the Forest. Existing airstrips are maintained at historical site conditions to provide safe and functioning airstrips.

# **Objectives (MA3a-Admin-OBJ)**

**01** Complete 5 to 15 facilities projects to improve energy efficiency or safety.

# **Suitability (MA3a-Admin-SUIT)**

- Administrative sites are not suitable for timber production. Timber harvest or other vegetation management activities may be allowed to maintain desired conditions for the specific administrative site.
- **02** Administrative sites are not suitable for commercial use of non-timber forest products.
- **03** Administrative sites are suitable for wheeled motorized travel on designated routes and areas unless otherwise restricted.
- **04** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# 3b Special Areas

Fourteen special areas, totaling 3,033 acres, are designated on the Forest. Table 30 displays these special areas and their primary features. All special areas are designated based on their special botanical features, with associated hydrologic or geological features in some areas. The boundary of the fen special areas includes a 300-foot buffer (riparian management zone) surrounding the fen. See figures B-50 to B-53 for a map of these areas.

Table 30. Special areas

Name	Location/Ranger District (RD)	Special character and features	Acresa
Condon Creek Botanical Area	Swan Valley, Swan Lake RD	Concentration of pond habitats occupied by water howellia, a federally threatened plant species. Associated upland mixed conifer forest, featuring several groves of mature ponderosa pine, as well as western larch and Douglas-fir.	226
Bent Flat Fen	Spotted Bear River, Spotted Bear RD	A unique, extremely rich fen with well-developed patterning, extensive marl deposits, and a large number of rare plants that are restricted to calcareous habitats. The Trail Creek Fire in August of 2015 burned the forests surrounding and immediately adjacent to the fen.	44
Gregg Creek Fen	Salish Mountains, Tally Lake RD	Features peatland and wet forest and shrub communities within an undisturbed portion of the Gregg Creek watershed. Rare plants present.	33
Lost Creek Fens	Swan Valley, Swan Lake RD	Lost Creek Fens contain two distinctly different types of fens separated by a patch of moist coniferous forest. The northern fen is at the toe of a slope. An upwelling spring supplies water to a thick accumulation of peat which gently slopes to the south. The southern fen has two shallow potholes filled with peat and alluvium. The water table fluctuates seasonally; drawdown in the fall hastens peat decomposition and minimizes peat accumulation. A number of rare plant species are present at both sites.	36
Meadow Lake Fen	Swan Lake RD	One of the few places on the forest that has a floating organic mat. Rare plants present. Loons and bog lemmings have also been observed at this lake.	62

Name	Location/Ranger District (RD)	Special character and features	Acres
Porcupine Fens	In tributary of Porcupine Creek, Swan Lake RD	Features two fens, which are part of a larger complex of fens. Porcupine Fen is at the toe of a slope from which several springs emerge. This constant supply of mineral-rich water has favored the accumulation of organic matter. The site supports a diverse flora. The site is largely ringed by wet to moist spruce forests, except on a portion of the west margin, where a harvested areas upslope of the fen extends down nearly to the fen. The site is an excellent example of a flow-through fen. A number of rare plants occur.	115
Sanko Creek Fen North	Salish Mountains, Tally Lake RD	Features two wetland areas. One is a small pond, up to 3 to 4 meters deep, and surrounded by a floating to anchored organic mat and a wet meadow. The other wetland is a north-south oriented fen. The fen is surrounded by moist spruce forest. The fen has a series of broad, gently sloping terraces with interspersed water tracks and upwelling pools of water. Western larch is common on adjacent uplands. Rare plant species have been observed at the site.	49
Sanko Creek Fen South	Salish Mountains, Tally Lake RD	Oriented east-west along the base of a slope. A number of seeps and springs emerge from the toe of this slope and maintain wet conditions in the peatland. One rare plant species has been observed here, as well as a possible bog lemming sighting	23
Trail Creek Fen	Spotted Bear River, Spotted Bear RD	A relatively large, highly calcareous peatland. The site contains three abandoned beaver dams and ponds and a well-developed peatland on the upper easternmost portion of the wetland. Several rare plants occupy this relatively large, well-developed peatland.	98
Trout Lake Fen	Hungry Horse RD	Trout Lake is an excellent example of an organic mat (floating and anchored) surrounding a deep pond. A sedge meadow lies southwest of the pond. Several species of sphagnum moss form a nearly continuous carpet adjacent to the pond. Rare plant species are known from the peat mat. The site is easily accessible by motor vehicle, and supports a handicapped-accessible fishing dock. Most of the organic mat, however, is undisturbed by human use.	34
Windfall Creek Fen	Swan Valley, Swan Lake RD	Occupies a basin formed by glacial scouring. Rare plant species have been observed here.	31
Glacier Slough	Glacier Creek, south end of the Swan Valley, Swan Lake RD	One of the largest wetlands in the Swan Valley, with a diversity of wetland and riparian associated plant and animal species, and adjacent forests of mixed conifer species.	1,690
Johnson Terrace	Evers Creek, a tributary of Logan Creek, Tally Lake RD	Includes mossy forb meadow on shallow residual soils over a Pre-Cambrian argillite bedrock dip slope that is inundated with water in the spring and dries out during summer. There are many diminutive plants that are restricted to this type of ephemeral spring habitat. In addition to botanical features, contains geologic/topographic features that harbor a diversity of plants unique among the forested landscape.	331
Fatty Creek Cedars	Swan Lake RD, in Fatty Creek	Moist, riparian-associated western red cedar forest type, supporting stands dominated by very large, old cedar trees and associated unique assemblages of understory plants. Provides aesthetic values associated with "ancient" cedar groves. Groves such as this are relatively rare on the Forest, due to the limited area with suitable site conditions for their development, past fire disturbance, and to removal through previous logging or development activities.	261
Total Acres			3,033

a. GIS dataset only has Condon Creek Botanical Area, Glacier Slough, Johnson Terrace, and Fatty Creek Cedars areas mapped therefore the acres differ.

## **Desired Conditions (MA3b-Special Area-DC)**

- O1 Special areas are in a substantially natural condition, where ecosystems primarily reflect the influence of natural processes, and where the plant and wildlife habitat values for which the special area was identified are maintained.
- **Minimal** to no invasive plant species occur within the special areas.
- **03** Educational and research opportunities featuring the plant communities are provided.
- In the Condon Creek Botanical Area, habitat conditions support sustainable and healthy populations of water howellia. Mature ponderosa pine and western larch forests occur, contributing to the landscape conditions that sustain water howellia habitat, as well as providing educational and research opportunities.

## **Guidelines (MA3b-Special Area-GDL)**

O1 Special areas should be protected from human disturbances that would adversely affect their special characters and features.

#### Suitability in Special Areas (MA3b-Special area-SUIT)

- O1 Special areas are not suitable for timber production. Vegetation management activities (such as prescribed fire) may be allowed for reasons specifically designed to maintain the values and desired conditions associated with the special area.
- **O2** Special areas are not suitable for commercial use of non-timber forest products.
- The fens, and Glacier Slough and Johnson Terrace special areas are not suitable for new trail construction, new wheeled motorized trails and areas, and associated structures. Existing trails that access these areas are suitable.
- **04** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# MA 4: Research Natural Areas, Experimental Forest and Demonstration Forest

#### Introduction

The Forest has six research natural areas, one experimental forest, and one demonstration forest. RNAs are permanently established to maintain representative areas of natural ecosystems and areas of special ecological significance. The Coram Experimental Forest (CEF) was established to study the ecology and silviculture of western larch in a mix with other commonly associated species. The Miller Creek Demonstration Forest (MCDF) was established to study the effect of prescribed fire and silvicultural treatments on regeneration and other forest conditions.

# 4a Designated Research Natural Areas

# **Description**

The Forest has six designated research natural areas, listed in table 31. The research natural areas are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on NFS lands. They serve as baseline areas for non-manipulative research, observation and study. Each research natural area has its own establishment record<sup>8</sup>, which contains detailed location maps, information on distinguishing features, and the purpose for establishment of the research natural areas. The research natural areas are cooperatively managed with the Rocky Mountain Research Station.

Table 31. Existing research natural areas (RNAs)

RNA	Location/ Ranger District (RD)	Key Features	Date established	Official acres <sup>a</sup>	GIS acres <sup>b</sup>
Coram	Within the Coram Experimental Forest, Hungry Horse-Glacier View RD	Forests of late-successional/old growth western larch and interior Douglas-fir stands.	1988	839	876
East Shore	Crane Mountain area, facing into Flathead Lake above Woods Bay, Swan Lake RD	Transition vegetation types ranging from aquatic and moist sites to dry sites within the Douglas-fir, grand fir and western red cedar habitat type series.	1991	646	654
Le Beau	Within Le Beau Creek in the Stillwater River drainage, Tally Lake RD	High diversity of vegetation types and geologic landforms. Western red cedar, western hemlock, grand fir, larch and herbaceous plant communities on glacier-formed rock land, lake, ponds, and wetlands.	1997	5,709	5,397
Little Bitterroot	Southwest of Marion along the Little Bitterroot River, Swan Lake RD "Island Unit"	Lies within a narrow, steep-walled canyon, with two narrow lakes at the base of the cliffs. Below the lakes are shrub-dominated riparian areas. Dry site Douglas-fir forests dominate, representing all four phases of the dry Douglas-fir/pinegrass habitat type.	1991	200	202

<sup>&</sup>lt;sup>8</sup> Establishment records are located at the Forest Supervisor's Office.

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RNA	Location/ Ranger District (RD)	Key Features	Date established	Official acres <sup>a</sup>	GIS acres <sup>b</sup>
Swan River	Along the Swan River south of Swan Lake, Porcupine Creek area, Swan Lake RD	Contains upland forests dominated by old western larch, as well as mature western red cedar, grand fir, western white pine, and Douglas-fir. Contains wetland and riparian plant communities dominated by western red cedar, spruce, black cottonwood, and various shrub and herbaceous species. Wet meadows, bogs, peatlands, river edges, and beaver ponds present.	1997	682	692
Tuchuck	Within Tuchuck Creek, a tributary of Trail Creek, which flows into the North Fork Flathead River just south of Canada border; Hungry Horse- Glacier View RD	Upper elevation and alpine vegetation types; avalanche chutes and open areas dominated by shrubs and herbaceous species; wet meadows and talus slopes. Extensive stands of whitebark pine, as well as alpine larch.	1991	2,062	2,050
		TOTAL ACRES		10,138	9,871b

a. Acres from both the establishment record (the official RNA acreage)

#### **Desired Conditions (MA4a-DC)**

- Research natural area lands are generally natural-appearing. Ecological processes such as plant succession and fire, insect, and disease activity function with limited human influences.
- Research natural areas serve as areas for the observation and study of relatively undisturbed ecosystems and ecological processes, including succession, and as baseline areas for measuring ecological change due to disturbances or stressors, such as climate change.
- The ecological features and values for which each RNA was established are protected and managed in accordance with the establishment records and in consultation with Rocky Mountain Research Station.

#### **Suitability (MA4a-SUIT)**

- RNAs are not suitable for timber production. Timber harvest and other vegetation management (such as prescribed fire) may be allowed for study and research purposes, and in situations where the values for which the RNA were designated would be degraded or lost without management.
- **02** RNAs are suitable for non-motorized travel with wheeled motorized travel suitable on designated routes, consistent with desired ROS settings as mapped to meet administrative, research and educational objectives.
- 03 Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

b. Acres from the FNF GIS datasets are presented in this table.

# 4b Experimental Forest and Demonstration Forest

## **Coram Experimental Forest**

#### Description

The approximately 7,500-acre Coram Experimental Forest (CEF) was established in 1933 to study the ecology and silviculture of western larch in a mix with other commonly associated species. Management of the CEF is the responsibility of the Rocky Mountain Research Station.

The Coram RNA is located within the CEF. More information about the Coram RNA is located in the description under MA 4a.

#### Desired Conditions (MA4b-CEF-DC)

- OEF serves as a demonstration and study area for researchers, educators, forest managers, and the public. CEF provides areas that enable the installation of new administrative or research studies to help answer current and future management questions, as well as for educational activities and demonstration purposes.
- Re-measurement and evaluation of long-term studies continue as well as the collection of baseline hydrology, climate and other resource information.
- Research facilities and infrastructure (e.g., office building, weather stations, signs) are sufficient to support the research and education programs of the CEF.

#### Standards (MA4b-CEF-STD)

- 01 Roads and trails shall be maintained to access research or demonstration areas.
- **02** Target shooting should not be authorized within the Coram Experimental Forest.

#### Guidelines (MA4b-CEF-GDL)

In order to reduce the risk of fire, overnight camping or campfires should not be authorized on the CEF.

#### Suitability for CEF (MA4b-CEF-SUIT)

- O1 CEF is not suitable for timber production; however, timber harvesting for salvage logging, for research purposes and to achieve desired vegetation conditions could occur, as mutually agreed upon between Rocky Mountain Research Station and the Forest.
- **02** CEF is not suitable for the removal of non-timber forest products for commercial use.
- O3 CEF is not suitable for the removal of the following non-forest products for personal use: firewood; Christmas trees; boughs; surface rock. Removal of other non-forest products for personal use (e.g. huckleberries, mushrooms) may occur.
- **04** CEF is not suitable for livestock grazing.
- **05** CEF is suitable for wheeled motorized travel on designated roads and trails.
- **06** CEF is not suitable for mountain biking off of existing roads or trails.
- **07** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

#### Miller Creek Demonstration Forest

#### Description

The approximately 4,900 acre Miller Creek Demonstration Forest (MCDF) was set aside in 1989 by the Forest and its management is the responsibility of the Forest. Research in this area began 23 years earlier in 1966 to study the effect of prescribed fire and silvicultural treatments on regeneration and other conditions within the mixed conifer forests typical of the area. The MCDF was established to encourage continuing research and to recognize the value of the area for educational and demonstration purposes.

MCDF is a multiple-use area and will have regularly scheduled timber harvest, active vegetation management practices (e.g., timber harvest, thinning, planting, prescribed burning), and provide ecosystem services and a diversity of recreation opportunities. Expected intensity of vegetation management is similar to MA 6c.

#### Desired Conditions (MA4b-MCDF-DC)

- MCDF serves as a demonstration and study area for researchers, educators, forest managers, and the public. Areas are provided for studies that help answer current or future management questions.
- Although natural ecological processes and disturbances are present, vegetation management activities have a dominant role in affecting the composition, structure, and pattern of vegetation. These management activities trend the vegetation towards the forestwide desired conditions for each biophysical setting.
- **03** Facilities are provided that adequately support the study and education programs of the MCDF.

#### Suitability for MCDF (MA4b-MCDF-SUIT)

- **01** MCDF is suitable for timber production.
- **02** MCDF is suitable for salvage logging and the removal of non-timber products for commercial or personal use.
- **03** MCDF is suitable for wheeled motorized travel designated roads and trails.
- **04** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# MA 5: Backcountry

#### Introduction

These management areas consist of relatively large areas characterized by an environment influenced primarily by natural ecological processes, such as natural succession, fire, insects, and disease. They provide a variety of motorized and non-motorized recreation opportunities. Trails are the primary improvements constructed and maintained for recreation users. In some areas, lookouts, cabins, or other structures are present as well as some evidence of management activities. There are four different backcountry management areas shown in table 32.

Table 32. Acres of backcountry management areas (MAs)

Backcountry MA	Motorized Use	Alt B acres	Alt C acres	Alt D acres
5a	Non-motorized year-round	156,104	61,052	291,071
5b	Motorized year-round (motorized vehicle use only designated roads, trails, and areas)	50,374	441	50,365
5c	Motorized over-snow vehicle opportunities (on designated routes and areas)	99,196	73,426	117,650
5d	Summer motorized (wheeled vehicle use on designated roads, trails, and areas)	9,855	0	9,855

# Desired Conditions (MA5-DC)

- **01** Backcountry areas provide for less developed, semi-primitive recreation opportunities with motorized travel as described in each backcountry management area.
- **02** Fire and other natural ecological processes play a major role in influencing vegetation conditions, with relatively low level of human influence, which provides for secure wildlife habitat. Desired vegetation conditions are achieved primarily through use of fire (prescribed and wildfire) and to a lesser extent through other methods (e.g., salvage harvest, whitebark pine thinning).

# Suitability for MA 5 (MA5-SUIT)

- **01** In all backcountry areas (MA 5a through d) are not suitable for timber production; however, low levels of timber harvesting for multiple-use purposes, for salvage logging and to achieve desired vegetation conditions could occur.
- **MA** 5a is not suitable for motorized travel.
- MA 5b is suitable for motorized travel consistent with desired ROS settings as mapped and only on designated roads, trails and areas.
- MA 5c is not suitable for wheeled motorized travel.
- **05** MA 5d is suitable for summer wheeled motorized travel consistent with desired ROS settings as mapped and on designated roads, trails and areas.
- **06** Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

# MA 6: General Forest

These general forest areas would provide a wide range of multiple uses, including providing habitat for wildlife, commercial and non-commercial forest products, and non-motorized and motorized recreation opportunities. Active vegetation management (such as prescribed burning, thinning and timber harvest) and other activities would occur to achieve desired vegetation and wildlife habitat conditions.

MA 6 is divided into three designations: 6a, 6b, and 6c. These designations display different levels of anticipated timber harvest intensity at the landscape scale, i.e. across the management area designation as a whole. Treatment prescriptions and timber volume removed at the stand level would not necessarily differ between MA 6a, 6b or 6c, but timber outputs across the management area are expected to differ because of various resource considerations that affect the amount of acres and/or rate of harvest over time. These considerations are described under each designation below.

Acres within each MA 6 designation are displayed in table 33.

Table 33. Acres of general forest management areas (MAs)

General Forest MA	Alt B acres	Alt C acres	Alt D acres				
6a-Low	119,944	214,605	116,659				
6b-Moderate	437,617	258,056	292,939				
6c-High	169,080	125,946	297,095				

#### 6a General Forest-Low

# Description

A low intensity of timber harvest is expected in MA 6a, and regularly scheduled timber harvest would not occur (unsuitable for timber production). MA 6a is located in areas with a higher level of other resource considerations or site limitations that would restrict active vegetation management, as compared to MA 6b or MA 6c. For example, MA 6a may be within grizzly bear security core; within high use white tail deer winter range; in important wildlife habitat connectivity areas; in areas of low site productivity; in areas with especially high scenic values; and/or within inventoried roadless areas. In combination, these and other factors are expected to considerably limit the regularity, rate and amount of timber harvest over time and space. Costs associated with timber harvest and other active vegetation management may be higher, including increased restrictions on road management and access. Outside of inventoried roadless areas, new road construction would be limited by standard FW-STD-IFS-02. Outside of inventoried roadless areas, the rate of harvest would be limited by standard FW-STD-IFS-03 and FW-GDL-IFS-01.

# **Desired Conditions (MA6a-DC)**

O1 Desired conditions for vegetation and wildlife habitat are achieved both through use of fire (primarily planned ignition prescribed fire) and through mechanical methods, such as timber harvest and thinning. These vegetation management activities have a dominant role in affecting the composition, structure, and pattern of vegetation, and maintaining or trending vegetation and wildlife habitat towards the desired conditions. Vegetation management activities, including roads outside of inventoried roadless areas, would be evident on the landscape, though generally less so than in MA 6b or 6c. Although natural ecological processes and disturbances are present, they are influenced more by human activity in this MA than in backcountry designations.

There are opportunities for both motorized and non-motorized recreation opportunities with some areas restricted by yearlong or seasonal closures to protect big game winter habitat, grizzly bear secure core, and/or wildlife habitat connectivity.

#### **Suitability (MA6a-SUIT)**

- These areas are not suitable for timber production; however, timber harvest to achieve desired vegetation conditions, for salvage logging, and for other purposes could occur.
- These areas are suitable for wheeled motorized travel consistent with desired recreation opportunity spectrum settings as mapped and on designated roads, trails and areas.
- 03 Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.

#### 6b General Forest-Moderate

#### **Description**

A moderate intensity of timber harvest is expected to occur in MA 6b, and these areas will have regularly scheduled timber harvest (suitable for timber production). MA 6b is located in areas where other resource considerations or site limitations are expected to restrict active vegetation management to a lesser degree than in MA 6a, but more than in MA 6c. For example, MA 6b includes areas within the PCA for grizzly bear, within white tail deer winter range, and/or within important wildlife habitat connectivity areas. In combination, these and other factors would limit the rate and amount of timber harvest over time and space. There may be increased costs associated with timber harvest and other vegetation management activities, as well as road management and access restrictions, in comparison to MA 6c areas. New road construction would be limited by standard FW-STD-IFS-02. The rate of harvest would be limited by standard FW-STD-IFS-03 and FW-GDL-IFS-01.

# **Desired Conditions (MA6b-DC)**

- O1 Desired conditions for vegetation and wildlife habitat are achieved primarily through mechanical methods, such as timber harvest and thinning, and through the use of planned ignition prescribed fire. These vegetation management activities have a dominant role in affecting the composition, structure, and pattern of vegetation, and maintaining or trending vegetation and wildlife habitat towards the desired conditions. Vegetation management activities, including roads, would be evident on the landscape. Although natural ecological processes and disturbances are present, they are influenced more by human activity in MA 6b than in MA 6a and backcountry designations.
- O2 There are opportunities for both motorized and non-motorized recreation, with some areas restricted by yearlong or seasonal closures to protect big game winter habitat, grizzly bear secure core, and/or wildlife habitat connectivity.

# **Suitability (MA6b-SUIT)**

- **01** These areas are suitable for scheduled timber production.
- These areas are suitable for wheeled motorized travel consistent with desired ROS settings as mapped and on designated roads, trails, and areas.
- 03 Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.
- These areas are suitable for new airstrip development in desired recreation opportunity spectrum class semi-primitive motorized and roaded natural.

# 6c General Forest-High

## **Description**

A higher intensity of timber harvest is expected to occur in MA 6c, as compared to MA 6a or MA 6b, and these areas will have regularly scheduled timber harvest (suitable for timber production). MA 6c is located in areas where other resource considerations or site limitations are expected to restrict active vegetation treatments to a lesser degree than either MA 6a or 6b. For example, MA 6c may include areas located outside the NCDE PCA for grizzly bear and/or within wildland-urban interface areas. In comparison to MA 6a and 6b, the rate and amount of timber harvest over time and space would be less limited, as would road management flexibility and access. Outside the NCDE PCA for grizzly bear, new road construction would facilitate timber harvest where needed and where consistent with desired conditions for other resources.

#### **Desired Conditions (MA6c-DC)**

- Desired conditions for vegetation and wildlife habitat are achieved primarily through mechanical methods, such as timber harvest and thinning, and through the use of planned ignition prescribed fire. These vegetation management activities have a dominant role in affecting the composition, structure, and pattern of vegetation, and maintaining or trending vegetation and wildlife habitat towards the desired conditions. Vegetation management activities, including roads, would tend to be more evident on the landscape than in MA 6a or 6b. Although natural ecological processes and disturbances are present, they are influenced more by human activity in this MA than in MA 6a, 6b or in backcountry designations.
- Motorized and non-motorized recreation opportunities are readily available, with some areas restricted by yearlong or seasonal closures to protect/maintain big game winter habitat, wildlife security, or habitat connectivity.

# **Suitability (MA6c-SUIT)**

- **01** These areas are suitable for scheduled timber production.
- These areas are suitable for wheeled motorized travel consistent with desired ROS settings as mapped and on designated roads, trails, and areas.
- 03 Suitability for motorized over-snow vehicle use by alternative is mapped in figures B-03 to B-05.
- These areas are suitable for new airstrip development in desired recreation opportunity spectrum class semi-primitive motorized and roaded natural.

# MA 7: Focused Recreation Area

#### Introduction

Focused recreation areas typically have certain types of recreation uses featured such as a large lake or reservoir, developed ski area or year-round resort, large campgrounds, or trail systems for featured recreational activities. Additional motorized and non-motorized recreation opportunities not specifically designated as MA 7 are also broadly available across the Forest, such as hiking, mountain biking, and over-snow motorized uses. The suitability of some of these additional recreation opportunities is identified in the MA descriptions and displayed on associated over-the-snow, motor vehicle use, and district maps.

Focused recreation areas by alternative are listed in table 34. Management direction pertinent to all MA 7 areas is included in this section. Specific management direction for each focused recreation area is provided under its associated geographic area section.

Table 34. Focused recreation areas by alternative

Focused Recreation Area	Geographic Area <sup>a</sup>	Featured Activities	Alt B acres	Alt C acres	Alt D acres
Ashley Lake (2 sites: north side 93 acres, south side 10 acres)	Salish Mountains	Developed recreation including camping, fishing, and boating	103	103	103
Big Creek Campground and Work Station	North Fork	Developed recreation including camping, boating, fishing and hiking; youth conservation education.	57	57	57
Big Mountain (includes Whitefish Mtn Resort)	North Fork and Salish Mountains	Downhill skiing, cross-country skiing, hiking, mountain biking, conservation education	4,111	4,111	4,111
Blacktail Mountain Ski Area	Salish Mountains	Downhill skiing, hiking, mountain biking,	891	891	891
Blacktail Wild Bill Trail System	Salish Mountains	Motorized trail riding opportunities	4,966	4,966	4,966
Blacktail-Foys (alternative D only)	Salish Mountains	Hiking, mountain biking, horseback use close to communities. Includes Lakeside to Blacktail, and Foy's to Blacktail trails.	N/A	N/A	1,047
Camp Misery Trailhead (alternative D only)	Swan Valley	Access to Jewel Basin Hiking Area	N/A	N/A	330
Crystal-Cedar Area (alternative D only)	North Fork	Dispersed non-motorized recreation, hiking, mountain biking, horseback use close to communities.	NA	NA	13,396
Cedar Flats Off- Highway Vehicle Area	North Fork	Motorized trail riding opportunities	2,008	2,008	2,008
Crane Mountain	Swan Valley	Mountain biking and dispersed recreation	1,023	1,023	1,023
Holland Lake Campground	Swan Valley	Developed recreation including camping, boating, fishing and hiking	593	593	593
Hungry Horse Off- highway Vehicle Area	Hungry Horse	Motorized trail riding opportunities	71	71	71
Hungry Horse Reservoir	Hungry Horse	Developed and dispersed recreation including camping, boating, fishing, hiking.	13,113	13,113	13,113
Ingalls Mountain (alternative D only)	Salish Mountains	Single-track wheeled motorized use on existing open roads. New connector routes may be create to provide a high elevation loop wheeled motorized trail.	N/A	N/A	2,431
Krause Basin (alternatives B and D only)	Swan Valley	Non-motorized trails and limited motorized trails on designated and signed routes	1,578	N/A	1,578
Lion Lake	Hungry Horse	Day use picnic site, hiking, fishing and, swimming	99	99	99

Focused Recreation Area	Geographic Area <sup>a</sup>	Featured Activities	Alt B acres	Alt C acres	Alt D acres
Nordic groomed ski areas	Salish Mountains and Middle Fork	Groomed cross country ski areas: Round Meadows, Essex, and Blacktail Mountain	3,906	3,906	3,906
Swan Lake Campground and day use area	Swan Valley	Developed recreation including camping, boating, fishing and hiking	95	95	95
Tally Lake Campground	Salish Mountains	Developed recreation including camping, boating, fishing and hiking	159	159	159
Tally Mountain (alternative D only)	Salish Mountains	Mountain bike loop trail opportunities	N/A	N/A	4,692
Werner-Nicola (alternative D only)	North Fork And Salish Mountain	Dispersed non-motorized recreation, hiking, mountain biking, horseback use close to communities.	NA	NA	6,392

a. See specific geographic areas in chapter 4 for additional management direction related to these focused recreation areas.

# Desired Conditions applicable to all MA7s (MA7-DC)

- Focused recreational opportunities are provided in specific areas in response to increasing demand.

  Local communities can readily access these areas for a variety of motorized and non-motorized experiences.
- These areas provide opportunities for large groups that may have higher levels of social interaction, as well as competitive and non-competitive events.
- Although natural ecological processes and disturbances are present within this management area, vegetation management activities play a dominant role in affecting the composition, structure, and pattern of vegetation across most of these focused recreation areas. These management activities maintain or trend the vegetation and wildlife habitat towards the desired conditions.

# Summary of Suitability within Management Areas and Inventoried Roadless Areas

Specific lands within the Forest will be identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the Forest as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use or activity (36 CFR 219.7 (e)(1)(v)).

Identifying suitability of lands for a use in the forest plan indicates that the use may be appropriate, but does not make a specific commitment to authorize that use. If certain lands are identified as not suitable for a use, then that use or activity may not be authorized without a site specific amendment to the forest plan. Prohibiting an existing or authorizing a new use requires subsequent, site-specific NEPA analysis. Generally, the lands on the Forest are suitable for uses and management activities appropriate for national forests, such as outdoor recreation, or timber, unless identified as not suitable.

Table 35 lists the management areas and table 34 lists some of the suitable activities that may be allowed to move towards or maintain desired conditions displays by management area and inventoried roadless areas. This list is not intended as a substitute for the actual desired conditions, standards, and guidelines found in each MA. It is intended as a summary and a reference for the reader to see what activities are generally allowed within different management areas. Please refer to the direction for each management area for specific direction. **Note: Planned activities may occur in areas that are not identified as suitable under the auspices of agency policy.** 

Table 35. Management areas

Code	ode Management Area Categories		Management Area Categories
1a	Designated Wilderness	5a	Backcountry non-motorized year-round
1b	Recommended wilderness	5b	Backcountry motorized year-round
2a Designated wild and scenic rivers		5c	Backcountry motorized over-snow vehicle opportunities
2b	Eligible wild and scenic rivers	5d	Backcountry summer motorized vehicle
3a	Administrative areas	6a	General forest low
3b	Special areas	6b	General forest medium
4a	Research natural areas	6c	General forest high
4b	Experimental and demonstration forests	7	Focused recreation areas

Table 36. Suitability<sup>a</sup> of management areas and inventoried roadless areas (IRAs) for specific uses or activities

Use or Activity	1a	1b	2a/2b Wild	2a/2b Scenic/Rec	3a/3b	4a	4b	5a	5b	5c	5d	6a	6b	6c	7	IRAs
Timber production (scheduled on rotation basis)	N	N	N	N	N	N	Y/N	N	N	N	N	N	Υ	Υ	Y/N	N
Timber harvest allowed	N	N	N	Υ	Y/N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y/N
Commercial use–special forest products and firewood	N	N	N	Y	N	N	Y/N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y
Personal use–special forest products and firewood	Υ	Υ	Υ	Υ	Y	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Grazing allotments	N	N	N	N	Y/N	N	Υ	N	N	N	N	Υ	Υ	Υ	N	Y
New facilities	N	N	N	Υ	Υ	N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y
Wheeled motor vehicles	N	N	N	Υ	Υ	N	Υ	N	Υ	N	Υ	Υ	Υ	Υ	Υ	Y
Mechanized transport (e.g. mountain bike)	N	Y/N	Υ	Υ	Y	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y
New airstrip	N	N	N	N	N	N	N	N	N	N	N	N	Υ	Υ	N	N
Road construction (permanent)	N	N	N	Υ	Υ	N	Υ	N	Υ	N	Υ	Υ	Υ	Υ	Υ	N
Road reconstruction	N	N	N	Υ	Y	N	Υ	N	Υ	N	Υ	Υ	Υ	Υ	Υ	N
Use of wildland fire to meet desired conditions	Υ	Υ	Υ	Υ	Y/N	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y

a. Y=yes, N=no, Y/N=potentially, in some areas, or varies by alternative; see specific management area section for clarification.

Chapter 3 120 Summary of Suitability

Suitability for motorized and non-motorized recreation may be determined at three levels: 1) the broad level for motorized suitability is done through management area descriptions that describes the general suitability of the management area; 2) the desired recreation opportunity spectrum settings (refer to table 37 and figures B-19 to B-24) describes desired summer wheeled motorized suitability and winter motorized over-snow vehicle use; and 3) the recreation opportunity spectrum can be further defined through site-specific decisions to show non-motorized and motorized suitability.

Suitability for motorized recreation is defined for summer and winter use. For summer suitability of motorized use, refer to the management areas and desired summer recreation opportunity spectrum class allocations, refer to figure B-19 to B-21 and table 37. For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.

Table 37. Desired summer and winter recreation opportunity spectrum class suitability

Class	Wheeled Motorized Suitability	Motorized Over-snow Vehicle Use <sup>9</sup>
Primitive	N	N
Semi-primitive non-motorized	N	N
Semi-primitive motorized	Y <sup>10</sup>	Υ
Roaded natural	Y	Υ
Rural	Υ	Y
Urban	Υ	Y

Chapter 3 121 Summary of Suitability

<sup>&</sup>lt;sup>9</sup> Motorized over-snow vehicle use has been further refined and is reflected in the over-snow suitability vehicle maps figure B-03 to B-05

<sup>&</sup>lt;sup>10</sup> Just because an area is suitable for motorized use, does not mean motorized use is allowable everywhere in that setting.



# Chapter 4. Geographic Area Direction

# Introduction

While the forestwide desired conditions indicate broad trends which we would expect to see over the next 10 to 15 years, we recognize that individual places across the Flathead have their own unique characteristics and conditions. These places, referred to as "geographic areas," define a landscape that people associate with on the Forest. Identifying these areas gives us the opportunity to fine-tune our forestwide management to better respond to more local conditions and situations. The Flathead has been divided into the following six geographic areas (see figure 2 below):

- Hungry Horse (HH)
- Middle Fork Flathead (MF)
- North Fork Flathead (NF)
- Salish Mountains (SM)
- South Fork Flathead (SF)
- Swan Valley (SV)

Geographic areas provide a means for describing conditions and trends at a more local scale if appropriate. Geographic areas are ecological areas that are synonymous with basin and watershed. Table 38 displays geographic area acreage and percent of geographic area in NFS lands.

Table 38. Acres within the six geographic areas (GAs) on the Flathead National Forest

GA	Total acres all ownerships	Forest acres	Percent of GA in NFS lands
Hungry Horse	331,752	286,234	86
Middle Fork	375,354	370,156	99
North Fork	389,682	320,044	82
Salish Mountains	836,805	262,859	31
South Fork	790,585	789,074	100
Swan Valley	533,139	364,440	68
Total acres	3,257,317	2,392,807	73

The geographic area section on the following pages provides an overview of the area, including unique characteristics, and geographic area desired conditions that describe what we want to achieve in specific geographic areas that are not necessarily covered by forestwide or management area desired conditions. Geographic area objectives, and in some cases standards and guidelines, are also specified. Maps of each geographic area can be found in appendix B. Each geographic area map (figures B-32 to B-49 by alternative) shows management area allocation, location of unique features, primary population centers, and major rivers and roads. Descriptions of the management areas can be found in chapter 3. Information on the biophysical settings referred to in each geographic area description, and the proportion within each geographic area, can be found in appendix D.

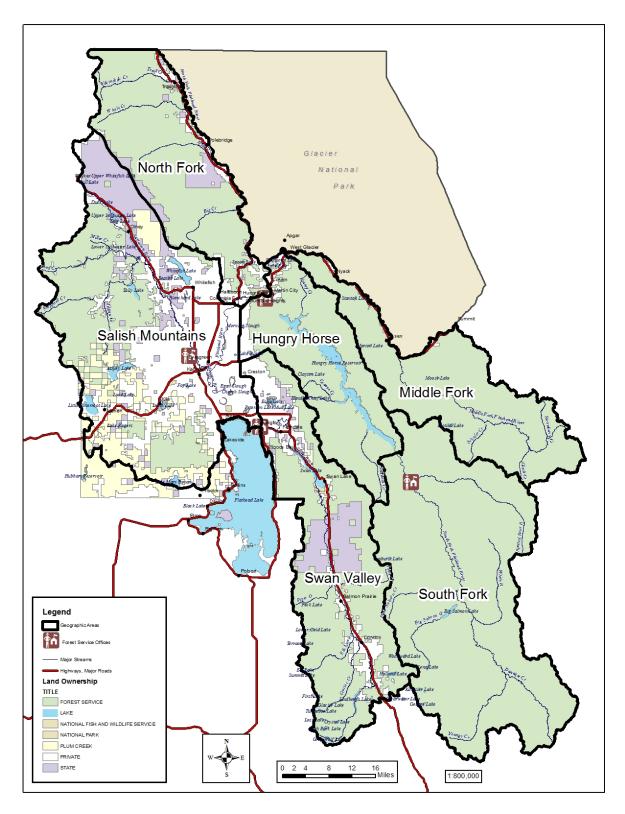


Figure 2. The six geographic areas on the Flathead National Forest

# Hungry Horse Geographic Area

#### **General Overview**

The Hungry Horse Geographic Area encompasses the lower half of the South Fork Flathead River basin, bordered by the Middle Fork Flathead River to the north, and dropping over the Swan Ridge to extend down to the Flathead Valley. The vast majority is in NFS ownership, with private lands primarily along the far north and east boundaries along the Highway 2 corridor and adjacent to the Flathead Valley. Portions of the Great Bear Wilderness lie within this geographic area. Portions of the Hungry Horse-Glacier View and Spotted Bear Ranger Districts lie within this geographic area.

Steep mountain slopes dissected by narrow stream channels characterize much of this geographic area. The Hungry Horse Reservoir is a primary feature within this geographic area. Elevations range from 3,200 feet near the town of Hungry Horse, to well over 8,000 feet on the highest mountain peaks. The vast majority of the geographic area is covered by forests on the cool moist-moderately dry biophysical setting. A small amount of cold, warm-moist and warm-dry settings also occur. For maps of the biophysical settings by geographic area see figures B-11 to B-16. Refer to appendix D for a description and acres of the biophysical settings within this geographic area.

The Hungry Horse Reservoir provides the focal point for much of the recreation activities that are popular in this area, including boating, fishing, camping, hiking and driving for pleasure on the open loop road that surrounds the reservoir. More primitive recreational activities are also popular in the wilderness and large, roadless areas of the geographic area. Timber production has been a primary use within this geographic area also. The crest of the Swan Range runs north-south and provides limited motorized recreation in a semi-primitive setting. The section of Highway 2 between Hungry Horse and West Glacier provides the gateway to Glacier National Park. This corridor has high use during the summer.

#### **Unique Characteristics**

- Contains the Hungry Horse Dam and Reservoir on the South Fork Flathead River. The dam, completed in 1953, impounds a reservoir, which is 35 miles long and covers over 23,500 acres.
- There is a popular 110-mile-long driving loop around the Hungry Horse Reservoir that provides access to areas of the reservoir and driving for pleasure opportunities.
- The area has a high quality fishery with a healthy bull trout population and an intact native fish assemblage; non-native fish, except grayling are not present.
- Most of the approximately 15,300 acre Jewel Basin Hiking Area lies within this geographic area, and contains hiking trails without motorized, mechanized, or stock use.
- The Swan Crest Trail (Alpine #7) provides a long stretch of trail on a high mountain ridge.
- The Coram Experimental Forest in this geographic area and has been set aside for forest/ecological research purposes. Embedded in this experimental forest is the Coram Research Natural Area.
- Hungry Horse Dam Visitor Center, operated by the Bureau of Reclamation, provides an opportunity for cooperative interpretation of Hungry Horse Reservoir and surrounding environment.

Table 39 displays the management area allocation by actual acres and percent by alternative for the Hungry Horse Geographic Area. In some instances management area allocations over-lap, e.g. an area that is MA1a designated wilderness may also be 2a designated wild and scenic river. In this table allocation of acres are listed under all assigned management areas even if an over-lap occurs, in other words as actual accounting. Refer to figure B-32, B-38, and B-44 for maps of this area by alternative.

Table 39. Hungry Horse Geographic Area management area actual allocation<sup>a</sup> (acres and percent)

Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent
1a Designated Wilderness	20,562	7%	20,562	7%	20,562	7%
1b Recommended wilderness	19,484	7%	137,185	47%		
2a Designated wild and scenic rivers	748	<1%	748	<1%	748	<1%
2b Eligible wild and scenic rivers	4,210	1%	4,210	1%	4,210	1%
3a Administrative areas	202	<1%	202	1%	202	1%
3b Special areas					12,776	4%
4a Research natural areas	876	<1%	876	1%	876	1%
4b Experimental and demonstration forests	7,478	3%	7,478	3%	7,478	3%
5a Backcountry non-motorized year-round	30,371	10%	210	<1%	28,493	10%
5b Backcountry motorized year-round, motorized vehicle use only on designated routes/areas	31,101	11%			31,093	11%
5c Backcountry motorized over-snow vehicle use	46,141	16%	18,936	7%	54,402	19%
5d Backcountry motorized summer, wheeled vehicle use only on designated routes/areas	526	<1%			526	1%
5a-d Backcountry <b>Total</b>	108,139	37%	19,146	7%	114,513	40%
6a General forest low	28,934	10%	39,128	14%	28,889	10%
6b General forest medium	85,654	30%	46,991	16%	78,187	27%
6c General forest high					7,443	3%
6a-c General forest <b>Total</b>	114,588	40%	86,119	30%	114,519	40%
7 Focused recreation areas	13,276	5%	13,276	5%	13,276	5%

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-HH-DC)

- Non-native aquatic species are not present in this geographic area except for grayling in Handkerchief Lake.
- **02** Lands mapped as winter big game habitat by MFWP in the area from Firefighter Mountain to Abbott Bay and in the Lion Lake area provide desired winter habitat conditions; including snow intercept cover for big game species (see appendix C for potential strategies since this will vary on a site specific basis).
- The Coram connectivity area (see figure B-54) provides habitat connectivity for a north-south movement corridor for wide-ranging species (e.g., grizzly bear, Canada lynx, wolverine) moving between the southern and northern watersheds on the Forest.
- Alternatives B and D: Lost Johnny and Six Mile areas provide quality motorized over-snow vehicle opportunities, including late-season opportunities. Alternative C: A portion of the late-season route is maintained but the late-season area is eliminated.

# Hungry Horse Management Area 7 Focused Recreation Direction

# **Suitability (GA-HH-MA7-SUIT)**

- **01** The following MA 7 areas are suitable for timber production: Hungry Horse Reservoir (*excluding the developed recreation sites and day use areas*).
- The following MA 7 areas are not suitable for timber production: developed campgrounds and day use areas within Hungry Horse Reservoir MA7; the Hungry Horse Off-Highway Vehicle Track; and Lion Lake. Timber harvest or other vegetation management activities may occur to achieve desired conditions for vegetation or for other multiple-use purposes associated with the area (such as public safety and health).
- For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.

# **Hungry Horse Reservoir (GA-HH-MA7-Reservoir)**

This MA 7 area surrounds the 35-mile long Hungry Horse Reservoir, consisting of a band that extends ¼ to ¾ mile from the shoreline, frequently bordering the main road that encircles the reservoir (roads #38 and #895). These two roads also access the Spotted Bear Ranger District, the South Fork Flathead Wild and Scenic River, and trailheads leading into the Bob Marshall and Great Bear Wilderness areas. These roads are commonly called the Hungry Horse Reservoir loop road which is a popular scenic loop drive, and access several boat launch sites, and numerous developed campgrounds and dispersed sites, providing over 250 campsites for visitors.

The recreation opportunity spectrum is roaded natural for summer and semi-primitive motorized for the winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comforter and social interactions with a well-defined road system. Semi-primitive provides backcountry skiing and snowmobiling opportunities where routes are typically ungroomed but are often signed and marked. Occasionally, historic cabins or warming huts are available for short breaks or overnight use. Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b in locations outside developed recreation sites.

#### Desired Conditions (GA-HH-MA7-Reservoir-DC)

- The Hungry Horse Reservoir area provides a diverse spectrum of recreational experiences, including boating, camping, fishing, hunting, berry-picking, photography, driving for pleasure and viewing of scenery and wildlife. Visitor facilities range from developed fee sites to dispersed (non-fee) sites with undeveloped areas interspersed between existing camping areas.
- **02** The southern end of Hungry Horse Reservoir emphasizes dispersed recreation accessible by boat and vehicle.
- The north end of the Hungry Horse Reservoir emphasizes recreational development that accommodates higher use levels at concentrated developed sites including boat launches.
- O4 Dispersed recreation sites in the Hungry Horse Reservoir area, along the shoreline and on islands have minimal impacts to shoreline vegetation and meet health and safety requirements.
- Motorized and non-motorized water-based recreation opportunities have sufficient reservoir access points along the Hungry Horse Reservoir for users to access the reservoir.

- Water-based outfitter and guides and livery provide water-based outfitting experience for the public on the Hungry Horse Reservoir.
- The loop road around the Hungry Horse Reservoir provide driving for pleasure opportunities and has vistas to view the reservoir and surrounding landscape and allow for passenger vehicles to travel in a moderate degree of user comfort and conveniences. Some sections of roads are paved or dust abated.
- **08** Hungry Horse Reservoir provides angling opportunities for bull trout and supports an intact native fish assemblage.

## Objectives (GA-HH-MA7-Reservoir-OBJ)

- **01** Improve 1 to 5 campgrounds.
- **02** Complete 2 to 5 vista enhancement projects along the Hungry Horse Reservoir.

# **Hungry Horse Off-Highway Vehicle Area (GA-HH-MA7-OHV)**

This MA 7 encompasses an area adjacent to the town of Hungry Horse, Montana that is available yearlong for motorized vehicles less than or equal to 50 inches wide. There is about two miles of motorized routes, including a concentration of trails in a 5 acre area that provide steep inclines, sharp turns, and other challenge features.

The recreation opportunity spectrum is roaded natural for both the summer and winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system.

#### Desired Conditions (GA-HH-MA7-OHV Area-DC)

The Hungry Horse Off-Highway Vehicle area provides day-use summer motorized opportunities close to local communities as well as opportunities for day-use special use events.

#### Lion Lake (GA-HH-MA7-Lion)

This 40 acre lake is located only 1.5 miles from the town of Hungry Horse, Montana and has two day-use sites. It is a very popular site for swimming, non-motorized boating, and picnicking. A hiking trail encircles the lake.

The recreation opportunity spectrum setting is roaded natural for both summer and winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system.

#### Desired Condition (GA-HH-MA7-Lion-DC)

Lion Lake and its facilities provide quality day-use, water-based recreational experiences in a natural setting close to local communities.

#### Objective (GA-HH-MA7-Lion-OBJ)

01 Construct an accessible day-use fishing platform on Lion Lake.

# Middle Fork Flathead Geographic Area

#### **General Overview**

The Middle Fork Geographic Area encompasses most of the Middle Fork Flathead River basin, and is bordered to the north by Glacier National Park, which contains the remaining part of the river basin. The east boundary of the geographic area follows the crest of the Continental Divide, adjacent to the Lewis and Clark National Forest. The Great Bear Wilderness and a portion of the Bob Marshall Wilderness make up the vast majority of this geographic area, and the geographic area is largely wild and undeveloped. Only about 1 percent of the geographic area is in non-NFS ownership. This geographic area encompasses portions of the Hungry Horse-Glacier View and Spotted Bear Ranger Districts.

Rugged, remote terrain, including high, jagged mountain peaks (most reaching 7,000 to 8,000 or more feet in elevation), encasing moist cirque basins, and steep mountain slopes dissected by narrow stream channels characterize much of the area. Cool moist-moderately dry and cold biophysical settings cover the vast majority of this geographic area. Very little to no warm-moist or warm-dry types are present. For maps of the biophysical settings by geographic area see figures B-11 to B-16. Refer to appendix D for a description and acres of the biophysical settings within this geographic area.

The Montana State Highway 2 corridor, on the northern boundary of this geographic area, is a busy area separating Glacier National Park on the north and the Great Bear Wilderness to the south. This corridor includes heavy recreational use on the Middle Fork River, heavy recreational and general traffic on the state highway, the Burlington Northern-Santa Fe railroad line, a natural gas line, electrical transmission lines, and other utility and communications facilities. The geographic area is popular for recreational use and is a focal point for hiking, horseback riding, hunting, fishing, and for river float trips on the Middle Fork of the Flathead Wild and Scenic River. Snowmobiling is popular in the Skyland Creek area, near Marias Pass. Cross-country skiing and snowshoeing are also popular activities.

#### **Unique Characteristics**

- The area has some of the highest densities of grizzly bears in the lower 48 states and is key grizzly bear habitat.
- The area has a high quality fishery with a healthy bull trout population.
- The Middle Fork Flathead River, a designated Wild and Scenic River, is a free-flowing river that originates in the Bob Marshall Wilderness.
- The Schafer Meadows Ranger Station is a seasonally operating historical facility. This, along with several backcountry guard stations, and an intricate trail system make up the Forest Backcountry Administrative Facilities Historic District.
- The geographic area contains the Schafer Meadows Airstrip, the only open airstrip within the Bob Marshall Wilderness Complex.
- Soils are highly unstable in the Puzzle/Morrison Creek areas which are east of the Lewis overthrust. Mass failures are more common in this area than other parts of the Forest.

Table 40 displays the management area allocation, acres and percent, by alternative for the Middle Fork Geographic Area.

Table 40. Middle Fork Geographic Area management area allocation<sup>a</sup> (acres and percent) by alternative

			•	•			
Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent	
1a Designated Wilderness	305,126	78%	305,126	78%	305,126	78%	
1b Recommended wilderness	9,049	2%	43,407	11%			
2a Designated wild and scenic rivers	17,996	5%	17,996	5%	17,996	5%	
2b Eligible wild and scenic rivers	10,581	3%	10,582	3%	10,582	3%	
3a Administrative areas							
3b Special areas							
4a Research natural areas							
4b Experimental and demonstration forests							
5a Backcountry non-motorized year- round	12,171	3%	68	<1%	20,286	5%	
5b Backcountry motorized year-round, motorized vehicle use only on designated routes/areas							
5c Backcountry motorized over-snow vehicle use	18,411	5%	6,232	2%	15,075	4%	
5d Backcountry motorized summer, wheeled vehicle use only on designated routes/areas							
5a-d Backcountry <b>Total</b>	30,582	8%	6,300	2%	35,361	9%	
6a General forest low	12,884	3%	9,576	2%	16,184	4%	
6b General forest medium	7,118	2%	350	<1%	6,515	2%	
6c General forest high					1,573	<1%	
6a-c General forest <b>Total</b>	20,002	5%	9,926	3%	24,272	6%	
7 Focused recreation areas	163	<1%	163	<1%	163	<1%	

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-MF-DC)

- The lower Middle Fork of the Flathead Wild and Scenic River corridor (from Bear Creek to Blankenship) is managed in cooperation with Glacier National Park to protect its outstandingly remarkable values. Management of infrastructure (e.g., pipelines, railroad, gas lines, highways) within the wild and scenic river corridor is coordinated with Glacier National Park.
- O2 Commercial outfitted river use continues to be a key element in providing guided fishing and whitewater experience on the Middle Fork of the Flathead River.
- Alternative B and D: The Challenge-Skyland groomed trail and area provide quality motorized over-snow vehicle recreational opportunities, including a late-season motorized over-snow vehicle use area. Alternative C: A portion of the late-season route is maintained but the late-season area is eliminated...
- Safe winter parking opportunities and access to NFS lands and trailheads off of US Highway 2 are provided in conjunction with support from partners (e.g., Montana Department of Transportation, Izaak Walton Inn, and Burlington Northern Santa Fe Railroad).

- **05** Essex Creek provides clean water for the Essex community.
- The Nyack, Essex, and Pinnacle connectivity areas (see figure B-54) provide habitat connectivity for wide-ranging species (e.g., grizzly bear, Canada lynx, wolverine) moving north-south between Glacier National Park and the Bob Marshall Wilderness and east-west in the Middle Fork watershed.
- **07** Emergency disaster response is implemented cooperatively with Burlington Northern Santa Fe Railroad and other cooperators including Great Northern Environmental Stewardship Area immediately to protect the Middle Fork Flathead River corridor and associated resources.
- 08 The Forest Backcountry Administrative Facilities Historic District adjacent to and within the Bob Marshall and Great Bear Wilderness areas provides national and regional recognition for wilderness and land management history.

# Objectives (GA-MF-OBJ)

**01** Acquire one or more parcels and/or provide one or more easements for wildlife crossings along Highway 2 and the Burlington Northern Santa Fe Railroad railway.

## Standard (GA-MF-STD)

The Schafer Meadows Airstrip provides public and administrative access for small aircraft not exceeding 550 landings annually.

# Middle Fork Focused Recreation Direction: Essex Nordic Groomed Ski Area

This is one of three MA 7 areas on the Forest that focuses on Nordic ski opportunities. This area provides about 20 miles of groomed ski trails on an approximately 163-acre area adjacent to the town of Essex, Montana, and about 28 miles east of West Glacier, Montana on Highway 2. The recreation opportunity spectrum setting is roaded natural for the summer and semi-primitive motorized during the winter season, primarily because snowmobiles are used to groom Nordic trails and this area is close to the highway and railroad. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Semi-primitive motorized provides opportunities for exploration and challenge in winter the backcountry. Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b.

#### Suitability (GA-MF-MA7-EssexNordic-SUIT)

- 01 The MA 7 Nordic Groomed Ski Areas are suitable for timber production.
- **02** These areas are suitable for wheeled motorized travel on designated roads, trails and areas.
- For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.
- A portion of the Middle Fork GA is withdrawn from mining and mineral leasing laws, subject to valid and existing rights per the North Fork Watershed Protection Act of 2013<sup>11</sup>. See figure B-54.

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<sup>&</sup>lt;sup>11</sup> Sec. 3063, North Fork Federal Lands Withdrawal Area, of the Buck McKeon National Defense Authorization Act was enacted fiscal year 2015.

#### Desired Conditions (GA-MF-MA7-EssexNordic-DC)

The Essex area provides quality groomed Nordic skiing and snowshoeing opportunities for the public that are easily accessed from local communities.

# North Fork Flathead Geographic Area

### General Overview

The North Fork Geographic Area lies within the North Fork Flathead River basin, and encompasses all the lands on the west side of the river. Lands on the east side of the river are managed by Glacier National Park. The headwaters of the North Fork Flathead River lie in Canada to the north. The crest of the Whitefish Range forms the west boundary of this geographic area, with the highest peaks reaching close to 8,000 feet in elevation. The northwest boundary of this geographic area is adjacent to the Kootenai National Forest. The southern boundary of this geographic area extends down to about 3,000 feet in elevation, and borders the Middle Fork Flathead River and the town of Columbia Falls, MT. Private and state land holdings are dispersed from the southern end of this geographic area north to the Canadian border, concentrated in the regions of gentler terrain nearest the river and nearest the town of Columbia Falls, MT. The geographic area includes the approximately 20,000 acre Coal Creek State Forest. This geographic area includes portions of the Hungry Horse-Glacier View Ranger District.

Steep mountain slopes bisected by narrow stream channels characterize most of this geographic area. From the Canadian border the North Fork is generally wide, with large areas of rolling terrain and terraces bordering the river Flathead River valley bottom and narrows at its southernmost end. The cool moist-moderately dry biophysical setting covers the great majority of this geographic area. Most of the remaining land is high elevation, with cold settings. A good representation of sites in the warm-moist biophysical setting occurs in the far southern end of the geographic area. Almost no warm-dry sites occur in the geographic area. For a map of the biophysical settings see figure B-13, and refer to appendix D for a description and acres of the biophysical settings within this geographic area.

The combination of large inventoried roadless areas and its proximity to Glacier National Park influence the kind of uses that this area has traditionally received. Recreational activities are popular, ranging from backcountry non-motorized uses to high quality motorized over-snow vehicle opportunities. Timber production has been a major activity in portions of this geographic area. The small communities of Polebridge and Hungry Horse are also within this geographic area.

### **Unique Characteristics**

- The North Fork Flathead River is one fork of the designated Flathead Wild and Scenic River a free-flowing river that originates in Canada and is managed cooperatively with Glacier National Park.
- Contains seven significant wetland complexes; some of the least impacted wetlands in the Flathead River watersheds.
- The Big Creek Work Center is currently occupied by Glacier Institute, which provides quality
  environmental education in cooperation with the Forest Service and other resource management
  agencies.
- The cabin and lookout rental program provides a popular recreation option for visitors, which includes six historic Forest Service cabins.
- The area has some of the highest densities of grizzly bears in the lower 48 states and is key grizzly bear habitat.

- Shares a border with Glacier National P and an international border with Canada referred to as the Transboundary Flathead.
- Contains Tuchuck Research Natural Area, which is a reference habitat for a subalpine larch/subalpine fir habitat type.
- A portion of the Whitefish Mountain Resort is within this geographic area.

Table 41 displays the acres identified within each management area for the North Fork Geographic Area.

Table 41. North Fork Geographic Area management area allocation (acres and percent) by alternative

Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent
1a Designated Wilderness						
1b Recommended wilderness	80,708	25%	143,833	44%		
2a Designated wild and scenic rivers	6,944	2%	6,944	2%	6,943	2%
2b Eligible wild and scenic rivers	10,728	3%	10,728	3%	10,729	3%
3a Administrative areas						
3b Special areas						
4a Research natural areas	2,050	1%	2,050	1%	2,050	1%
4b Experimental and demonstration forests						
5a Backcountry non-motorized year- round	63,849	20%	51,258	16%	129,138	40%
5b Backcountry motorized year-round, wheeled vehicle use only on designated routes/areas						
5c Backcountry: motorized over-snow vehicle use	9,274	3%	12,012	4%	14,787	5%
5d Backcountry: wheeled motorized vehicle use only on designated routes/areas						
5a-d Backcountry Total	73,123	22%	63,270	19%	143,925	45%
6a General forest low	55,891	17%	46,498	14%	52,282	16%
6b General forest medium	92,948	29%	49,641	15%	67,010	21%
6c General forest high					17,341	5%
6a-c General forest Total	148,838	45.64%	96,140	29%	136,633	43%
7 Focused recreation areas	3,754	1%	3,754	1%	19,807	6%

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-NF-DC)

- O1 Commercial outfitted river use continues to be a key element in providing guided fishing and boating experience on the North Fork of the Flathead River.
- Alternatives B and D: Additional motorized over-snow vehicle opportunities exist in designated areas in the McGinnis, Deep and Look-out Creek areas. Alternative C: The Canyon Creek route is maintained but the late-season area is reduced in size.

- O3 Designated motorized over-snow vehicle areas remain on the landscape to continue to provide oversnow opportunities.
- **04** The North Fork road has vistas and vehicle pullouts to view Glacier National Park and the North Fork of the Flathead River.
- **05** A system mountain bike trail provides alpine riding opportunities in the Whitefish Range.
- The North Fork of the Flathead Wild and Scenic River corridor is managed in cooperation with Glacier National Park to protect its outstandingly remarkable values.
- The Haskill Basin connectivity area (see figure B-54) provides habitat connectivity for wideranging wildlife species (e.g., grizzly bear, Canada lynx, wolverine) moving north-south between the Swan Range and the Whitefish Range.
- The North Fork and North Whitefish Range connectivity areas (see figure B-54) provides habitat connectivity for wide-ranging wildlife species (e.g., grizzly bear, Canada lynx, wolverine) moving between Glacier National Park and the Whitefish Range.
- Lands mapped as winter white-tailed deer habitat by MFWP from lower Big Creek to Polebridge, Montana provide desired winter habitat conditions; including snow intercept cover for big game species (see appendix C for potential strategies since this will vary on a site specific basis).
- Migratory bull trout and westslope cutthroat trout populations exist and Transboundary agreements with Canada protect water quality to sustain these important native fish.
- Canyon Creek groomed trail and the Big Mountain area provides quality motorized over-snow vehicle use, including late-season use within the Canyon Creek trail corridor.
- 12 Red Meadow Road and Trail Creek Road provide access, including emergency egress, across the Whitefish Divide.

# Objectives (GA-NF-OBJ)

- 01 Complete one vista enhancement and vehicle pull out project.
- 02 Complete 1 to 3 trails that provide for mountain bike opportunities in the Whitefish Range vicinity.
- Acquire one or more parcels and/or provide one or more easements for one wildlife crossings along Highway 2 (Badrock Canyon), the North Fork Road #486, and/or the Burlington Northern Santa Fe Railroad railway.
- **04** Improve 1-2 campgrounds.

# Guidelines (GA-NF-GDL)

Timber harvest activities should maintain sufficient canopy to provide snow intercept cover to meet desired conditions for winter big game habitats, as mapped by Montana Fish, Wildlife and Parks, and as determined by site-specific analysis.

# Suitability (GA-NF-SUIT)

- **01** These areas are suitable for motorized travel designated routes and areas.
- For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.

The North Fork GA is withdrawn from mining and mineral leasing laws, subject to valid and existing rights per the North Fork Watershed Protection Act of 2013<sup>12</sup> (refer to figure B-53).

# North Fork Management Area 7 Focused Recreation Direction

## **Suitability (GA-NF-MA7-SUIT)**

- The following MA 7 areas are suitable for timber production: Cedar Flats Off-Highway Vehicle Area; portions of Crystal-Cedar (alternative D only); and portions of Werner-Nicola (alternative D only). Refer to figure B-55.
- The following MA 7 areas are not suitable for timber production: Big Mountain; Big Creek Campground and Workstation; and portions of Werner-Nicola (alternative D only). Refer to figure B-55. Timber harvest or other vegetation management activities may occur to achieve desired conditions for vegetation or for other multiple-use purposes associated with the area (such as public safety and health).

# **Big Mountain (GA-NF-MA7-Big Mtn)**

This management area 7 is located in both the North Fork and the Salish Mountains Geographic Area. Plan components are found under the Salish Mountain GA section.

## **Cedar Flats Off-Highway Vehicle Area**

The management area 7 is located close to the town of Columbia Falls, Montana and primarily offers summer motorized use on designated routes (5 miles); other activities include biking, hiking, Nordic skiing and snowshoeing. Opportunities for expansion of routes within the MA7 area exist if compatible with other resource needs. Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b. The recreation opportunity spectrum setting is roaded natural for both the summer and winter. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system.

#### Desired Conditions (GA-NF-MA7-Cedar Flats OHV-DC)

The Cedar Flats Off-Highway Vehicle Area provides a system of mechanized and motorized trails for mountain biking and off-highway vehicles on designated routes.

# **Big Creek Campground and Work Station**

This management area 7 encompasses both the Big Creek Campground and the adjacent work station, a historic Flathead National Forest Ranger Station. The Big Creek campground lies adjacent to the North Fork Flathead River, within the Wild and Scenic River corridor. The Big Creek Outdoor Education Center is located at the Big Creek Work Station, where the Glacier Institute, a private non-profit under a permit with the Forest Service, has provided field-based educational experiences for over 20 years. The recreation opportunity spectrum setting for the Big Creek Campground and Work Station is roaded natural for both the summer and winter season which provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system.

<sup>&</sup>lt;sup>12</sup> Sec. 3063, North Fork Federal Lands Withdrawal Area, of the Buck McKeon National Defense Authorization Act was enacted fiscal year 2015.

### Desired Conditions (GA-NF-MA7-DC-Big Creek)

**01** Big Creek Work Station provides a base for quality, facilitated conservation and environmental education on NFS land, in partnership with non-governmental organizations.

## **Alternative D: Crystal-Cedar Area**

This area is located close to the towns of Columbia Falls and Kalispell, Montana and offers a variety of front country summer and winter recreational opportunities, including dispersed camping, hiking, mountain biking, snowshoeing, and Nordic skiing. The desired recreation opportunity spectrum setting is roaded natural for the summer and a mixture of roaded natural, semi-primitive motorized and semi-primitive non-motorized settings. Roaded natural setting provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Semi-primitive motorized winter setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked with additional vast areas to travel cross-country. Winter semi-primitive non-motorized setting provides solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Trails are un-groomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b.

### Desired Conditions (GA-NF-MA7-Crystal-Cedar-DC)

Recreational opportunities within the Crystal-Cedar Area provide a diversity of year-round recreational activities that are close to local communities.

#### Alternative D: Werner-Nicola

This area is located northwest of the Whitefish Mountain Ski Resort and offers a variety of front country recreational opportunities such as hiking, dispersed camping, mountain biking, backcountry skiing and snowshoeing. The desired recreation opportunity spectrum setting is roaded natural in the summer and a mix of semi-primitive motorized and semi- primitive non-motorized in the winter. Semi-primitive motorized winter setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked with additional vast areas to travel cross-country. Winter semi-primitive non-motorized setting provides solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Trails are un-groomed and often not marked. Rustic facilities, such as historic cabins, and yurts may exist, but are rare. Please see figures B-56 to B-57 for the distribution of settings in this management area 7 area.

Vegetation management activities occur to achieve desired conditions in portions of this MA 7 area, with the expected intensity of vegetation management similar to MA 6a or 6b (refer to figure B-55).

#### Desired Conditions (GA-NF-MA7-Werner-Nicola-DC)

**01** Recreational opportunities within the Werner-Nicola Area provide a diversity of year-round recreational activities that are close to local communities.

# Salish Mountains Geographic Area

### **General Overview**

The Salish Mountain Geographic Area lies in the relatively gently sloped, rolling terrain of the Salish Mountain range, and includes most of the main Flathead River valley. National Forest System lands comprise 31 percent of the area, with most land in private or state ownership, including the Stillwater State Forest. Elevations are relatively low and the terrain relatively rolling when compared to the rest of the forest, ranging from about 2,900 feet in the Flathead River valley bottom up to about 6,500 feet on the peaks that form the western boundary of the geographic area, adjacent to the Kootenai National Forest. Private ownership and Flathead Indian Reservation lands border to the south. The Tally Lake Ranger District and the portion of the Swan Lake Ranger District that lies west of the community of Lakeside, Montana are within this geographic area.

Due to the favorable topography and relatively close proximity to human settlements, lands within this geographic area were some of the earliest to be influenced by activities, such as logging, grazing and fire suppression, associated with settlement of the surrounding area by Euro-Americans in the mid to late 1800s. A wide network of roads currently exists to access private ownership and federal lands that have been managed primarily for timber production during the last several decades. Communities near this area include Whitefish, Kalispell, Olney, Lakeside, Marion, Kila and Somers.

The cool-moist to moderately dry biophysical setting covers the majority of the geographic area. However, nearly a quarter of the total acres on the Forest in the warm-dry biophysical setting lie within this geographic area, due to the preponderance of lower elevation sites and generally drier soils and weather patterns. A small portion of the Forest sites in the warm-moist biophysical setting also occur, concentrated in the north end within the Stillwater River basin. Very little high elevation, cold settings occur in this geographic area. For a map of the biophysical settings see figure B-14. Refer to appendix D for a description and acres of the biophysical settings within this geographic area.

Recreation is a major use within this geographic area, including hiking, hunting, mountain biking, motorized trail riding, horseback riding, snowmobiling and skiing. Timber production is another major use.

# **Unique Characteristics**

- Numerous large lakes, including Tally Lake, Little Bitterroot Lake, Upper and Lower Stillwater Lakes, Ashley Lake, and Whitefish Lake, provide a variety of water-based recreational opportunities.
- Whitefish Mountain Resort and Blacktail Mountain Ski Area are popular destinations for both local residents and visitors.
- The Pete Ridge area is one of the most important white-tailed deer winter ranges in Montana.
- The Lebeau and Little Bitterroot Research Natural Areas and Johnson Terrace are unique topographic features that harbor a diversity of plants unique among the forested landscape.
- Seven ecologically significant wetland complexes with a diversity of plants and features.

Table 42 displays the acres by alternative identified within each management area for the Salish geographic area.

Table 42. Salish Mountains Geographic Area management area allocation<sup>a</sup> (acres and percent) by alternative

Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent
1a Designated Wilderness						
1b Recommended wilderness			5,950	2%		
2a Designated wild and scenic rivers						
2b Eligible wild and scenic rivers	2,599	1%	2,599	1%	2,599	1%
3a Administrative areas	107	<1%	107	<1%	107	<1%
3b Special areas	331	<1%	331	<1%	331	<1%
4a Research natural areas	5,599	2%	5,599	2%	5,599	2%
4b Experimental and demonstration forests	4,942	2%	4,942	2%	4,942	2%
5a Backcountry non-motorized year- round	6	<1%	6	<1%	6	<1%
5b Backcountry motorized year-round, wheeled vehicle use only on designated routes/areas						
5c Backcountry: motorized over-snow vehicle use						
5d Backcountry: wheeled motorized vehicle use only on designated routes/areas						
5a-d Backcountry Total	6	<1%	6	<1%	6	<1%
6a General forest low	8,774	3%	35,367	13%	5,709	2%
6b General forest medium	60,580	23%	76,567	28%	27,778	11%
6c General forest high	169,080	64%	125,946	47%	193,041	73%
6a-c General forest Total	238,432	90%	237,881	88%	226,528	86%
7 Focused recreation areas	12,282	5%	12,282	5%	24,188	9%

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-SM-DC)

- Within NCDE zone 1, including the Salish DCA (see figure B-01), roads provide for public and administrative access to National Forest System lands while keeping disturbance and displacement of grizzly bears (during the non-denning season) at levels known to have been compatible with a stable to increasing grizzly bear population in the NCDE. The DCA provides habitat that can be used by female grizzly bears and allows for bear movement between grizzly bear ecosystems.
- Outside the NCDE PCA and Salish DCA, motorized trails (single track or OHV) provide highelevation loop opportunities.
- 03 The Swift Creek-Stillwater connectivity area (see figure B-54) provides habitat connectivity for wide-ranging wildlife species (e.g., grizzly bear, Canada lynx) moving between the Whitefish and Salish Mountain Ranges.
- O4 Security from motorized disturbance exists in key areas for big game species during the calving, hunting, and winter seasons (e.g. security for wintering white-tailed deer on NFS lands adjacent to private lands in the Pete Ridge/Pilot Knob and Rogers Lake to Smith Lake areas).

Lands mapped as white-tailed deer winter habitat by MFWP provide desired winter habitat conditions; including snow intercept cover for big game species, in the following areas: 1) Pete Ridge, Pilot Knob, the area from Rhodes Draw to just north of Good Creek and from the Stillwater River west to Tally Lake and Lost Creek; 2) Porter, Mount, Truman, Emmons, Stoner, and Cramer Creek sub-watersheds (see appendix C for potential strategies since this will vary on a site specific basis).

- **06** Transitory forage is available within active grazing allotments.
- Haskill Basin which is the municipal watershed for the city of Whitefish, Montana, is managed to reduce the risk of high intensity fires that have the potential to affect water quality.
- Alternative C: In areas between the primary conservation area and the Salish Demographic Connectivity Area, National Forest System lands are consolidated and conservation easements with willing landowners are supported in a manner that provides habitat connectivity and facilitates movement of wildlife.

# Objectives (GA-SM-OBJ)

- On Construct and designate approximately 1 to 3 miles of motorized trail connectors that provide high elevation loop opportunities outside the NCDE PCA and Salish DCA where consistent with desired recreation opportunity spectrum settings.
- **02** Construct a non-motorized trail that connects the Whitefish Trails<sup>13</sup> to NFS lands.
- Implement vegetation treatments within Haskill Basin (Whitefish) municipal watershed to reduce the risk of high severity fire that could potentially affect water quality. Also see GA-SM-DC-07.

# Standards (GA-SM-STD)

- In the Flathead National Forest portion of NCDE zone 1 (including the Salish Demographic Connectivity Area)(see figure B-01), there shall be no net increase in miles of roads open to public motorized use on National Forest System lands above the baseline (see glossary), calculated as the miles of motorized routes on NFS lands divided by the acres of NFS lands. This standard does not apply to the following:
  - motorized use by agency personnel or others authorized by the appropriate agency personnel;
  - temporarily opening a road for a short periods of time to allow for public firewood gathering and other authorized use;
  - updated/improved road data without an actual change on the ground;
  - changes in technology or projections result in changed calculations without actual change on the ground (e.g., a switch from NAD27 to NAD83 projection);
  - a road closure location is moved a short distance (e.g. to the nearest intersection or turnout) to a better location to allow turn-arounds providing for public safety, to reduce vandalism, or to improve enforcement of the road closure;
  - the agency exchanges, acquires, buys or sells lands;

<sup>&</sup>lt;sup>13</sup> Find additional information about this trail system at http://whitefishlegacy.org.

- a change in an open road is necessary to comply with Federal laws (e.g., Architectural Barriers Act of 1968, as amended);
- motorized use for mining activities (as authorized under the Mining Law of 1872) and oil and
  gas activities (as authorized under the Federal Onshore Oil and Gas Leasing Reform Act of
  1987) because these types of permitted resource development are subject to existing rights and
  have a separate set of standards and guidelines;
- a change in an open road is necessary to address grizzly bear-human conflicts, human safety concerns or resource damage/concerns (e.g. a road paralleling a stream may be decommissioned and replaced by a new upslope road to reduce water quality impacts);
- motorized use for emergency situations as defined by 36 CFR 215.2;
- temporary roads (see glossary).

Alternative C: Applies to roads in all of zone 1 and also applies to motorized trails in the Salish DCA.

# Guidelines (GA-SM-GDL)

Elk security should be provided in key areas during the elk calving, hunting, and winter seasons to contribute to Montana Fish Wildlife and Parks objectives for elk populations, as well as types of hunter access (since these change over time, specific areas and dates would be identified at the project level).

## Salish Mountains Management Area 7 Focused Recreation Direction

## **Suitability (GA-SM-MA7-SUIT)**

- The following MA 7 areas are suitable for timber production: Blacktail Mountain Nordic Ski Trail; Round Meadows Nordic Ski; Blacktail Wild Bill Trail System; Blacktail-Foys; Tally Mountain; Ingalls Mountain.
- The following MA 7 areas are not suitable for timber production: Blacktail Mountain Ski Area, Big Mountain, Tally Lake Campground, and Ashley Lake Campground. Timber harvest or other vegetation management activities may occur to achieve desired conditions for vegetation or for other multiple-use purposes associated with the area (such as public safety and health).
- 03 These areas are suitable for motorized travel on designated roads, trails and areas.
- For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.

# **Big Mountain (GA-SM-MA7-Big Mtn)**

This management area 7 is located in both the North Fork and Salish Mountain Geographic Areas. The area provides a variety of both winter and summer recreational opportunities, including downhill and Nordic skiing, snowshoeing, hiking, biking, berry-picking and snowmobiling. The Whitefish Mountain Resort permit area is within this management area. The Summit Nature Center is located at the Whitefish Mountain Resort on the top of Big Mountain and, in partnership with the resort, offers conservation education and a hands-on discovery center.

The desired recreation opportunity spectrum setting is rural for both the summer and winter season. Winter rural setting are high- use areas. Groomed motorized and non-motorized trails offer users the chance to get outside for a day trip or take longer, cross-country excursions. These areas are accessed

from paved and plowed roads and are generally close to population centers. User comfort facilities such as toilets, restaurants, heated shelter facilities, and information and education are commonly present.

Summer rural recreation opportunity spectrum settings are high-use areas. These highly structured and hardened settings accommodate large group gatherings and serve as day-use destinations. These settings also function as outdoor classrooms for interpretive programs and other structured learning. Roads and parking areas are generally paved and structures and facilities provide shelter, sanitation, potable water and other amenities.

Please see figures B-56 to B-57 for the distribution of settings in this management area 7 area.

## Desired Conditions (GA-SM-MA7- Big Mtn-DC)

- **01** The Canyon Creek groomed trails provide quality motorized over-snow recreation consistent with the desired recreation opportunity spectrum settings. Mixed-use of motorized over-snow vehicles and downhill skiers are compatible in the Canyon Creek area.
- **O2** A quality conservation and environmental education program is provided in partnership with the Whitefish Mountain Resort.
- 63 Forest conditions within the Whitefish Mountain Resort permit area are conducive to achieving the desired recreational setting and experience for users. Forests have structure, composition and densities that are resilient to disturbances such as fire, insects and disease.
- Year-round recreational opportunities in an alpine setting exist at the Whitefish Mountain Resort on Big Mountain. Winter recreation opportunities occur in all portions of the Whitefish Mountain Resort permit area. Summer recreation opportunities in the Whitefish Mountain Resort permit area are concentrated on the south facing slope and in areas immediately adjacent to existing open roads in order to reduce the risk of grizzly bear-human conflicts in the primary conservation area adjacent to high human use areas of the Whitefish Mountain Resort (figure B-01).
- **05** Existing groomed motorized over-snow vehicle routes would continue to provide recreation opportunities to Whitefish Mountain Resort on Big Mountain.
- A connective non-motorized trail system exists linking the Whitefish Legacy Trails to NFS lands in the Haskill Basin area, summit of Big Mountain and the Whitefish Divide.

#### Guideline (GA-SM-MA7-Big Mtn GDL)

To reduce grizzly bear-human conflicts the Whitefish Mountain Resort during the non-denning season, existing mitigation measures for grizzly bears regarding food/garbage handling, odor control, and grizzly bear education at the summit house should be retained.

### Blacktail Mountain Ski Area (GA-SM-MA7-BlacktailSki)

This MA 7 area includes the Blacktail Mountain Ski permit area, which provides downhill skiing winter recreational opportunities. The recreation opportunity spectrum setting is roaded natural in the summer season and rural in the winter season. Roaded natural setting provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Winter rural setting are high- use areas. Groomed motorized and non-motorized trails offer users the chance to get outside for a day trip or take longer, cross-country excursions. These areas are accessed from paved and plowed roads and are generally close to population centers. User comfort facilities such as toilets, restaurants, heated shelter facilities, and information and education are commonly present.

### Desired Conditions -SM-MA7-BlacktailSki-DC)

- Forest vegetation conditions within the Blacktail Mountain Ski Area are conducive to achieving the desired recreational setting and experience for users.
- A non-motorized trail system exists on NFS lands to connect Blacktail Mountain to trails on adjacent ownerships (Lakeside, Montana and Foy's Lake area).
- Maintain a non-motorized trail system that connects the community of Lakeside, Montana to Blacktail Mountain.
- **66** Facilities at the ski area provide year-round recreation within the existing Blacktail Mountain Ski Area permit boundary.

#### Objectives (GA-SM-MA7-Blacktail-OBJ)

Construct a non-motorized trail that connects NFS lands in the vicinity of Blacktail Mountain to trails on other ownerships in the Foy's Lake area (Foy's to Blacktail Trail System).

### Blacktail Mountain Nordic Ski Trail (GA-SM-MA7-BlacktailNordic)

This is one of three MA 7 areas on the Forest that focuses on Nordic ski opportunities. This area provides about 17 miles of ski trails on approximately a 2,533 acre area in close proximity to the town of Lakeside, Montana. The area also provides mountain biking, hiking, wheeled motorized use, and horseback riding opportunities in the summer.

The recreation opportunity spectrum is a mixture of roaded natural and semi-primitive motorized for the summer season and a mixture of semi-primitive motorized and semi-primitive non-motorized for winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Summer semi-primitive motorized recreation opportunity spectrum settings provide motorized recreation opportunities in backcountry settings. Routes are designed for off-highway vehicles and high clearance vehicles. Mountain bikes and other mechanized equipment may also be present. Facilities are rustic and are used for the purpose of protecting the setting's natural and cultural resources.

Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked with additional areas to travel cross-country. Winter semi-primitive non-motorized setting provides solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Trails are generally un-groomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6c.

#### Desired Conditions (GA-SM-MA7-BlacktailNordic-DC)

The Blacktail Mountain Cross Country Ski Area provides Nordic skiing and snowshoeing opportunities in the winter and recreation opportunities such as hiking, wheeled motorized use, mountain biking and equestrian use in the summer that is close to local communities.

### Blacktail Wild Bill Trail System (GA-SM-MA7-BlacktailOHV)

This area located west of Lakeside, Montana provides about 10 miles of trails available for use by off-highway vehicles, as well as mountain biking, horseback riding and hiking. The Blacktail Wild Bill OHV Trail was designated as a National Recreation Trail in the 1970s. It is popular with jeep and ATV users.

The recreation opportunity spectrum is roaded natural in the summer season and a mixture of roaded natural and semi-primitive motorized in the winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6c.

## Desired Conditions (GA-SM-MA7-BlacktailOHV-DC)

The Wild Bill Off-Highway Vehicles National Recreation Trail provides yearlong recreation opportunities close to local communities. Wheeled motorized vehicle use occurs on designated routes, with loop trails and trail connectors to the Blacktail and Truman Creek Off-Highway Vehicles Trail systems. Challenge features for off-highway vehicles are provided along a portion of the trail system.

## Round Meadows Nordic Skiing (GA-SM-MA7-Round Meadows)

This MA 7 is one of three areas on the Flathead National Forest that focuses on Nordic ski and snowshoeing opportunities. It provides about 12 miles of groomed Nordic ski trails on about 1,209 acres, 12 miles west of the city of Whitefish, Montana. Summer recreational opportunities include horseback riding, biking and hiking. The recreation opportunity spectrum setting is roaded natural in the summer season and semi-primitive non-motorized in the winter season. Roaded natural provides for a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Winter semi-primitive non-motorized setting provides solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Trails are generally ungroomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b.

### Desired Conditions (GA-SM-MA7-Round Meadows Nordic-DC)

- The Round Meadows Cross-country Ski Area provides groomed Nordic skiing and snowshoeing opportunities in the winter and non-motorized recreation opportunities such as hiking, mountain biking and equestrian use in the summer.
- **O2** A hut-to-hut system provides for progressive use of forest facilities that link Round Meadow with Sylvia Lake.

# Tally Lake Campground (GA-SM-MA7-Tally Lake)

This developed campground is located about 12 miles west of Whitefish, Montana, on the northern shore of Tally Lake, the second deepest lake in Montana. Camping, fishing, boating, hiking, horseback riding, biking, picnicking and swimming are popular activities in this area. The campground has 40 campsites, boat launch, open air pavilion, beach area, picnic site, and water. The Tally Lake pavilion is a timber

frame open air pavilion with parking for 50 vehicles, vault toilet, picnic tables, fire grill, group fire ring, horse pit, volleyball court, and nature trail.

## Desired Conditions (GA-SM-MA7-Tally Lake-DC)

Tally Lake Campground provides a quality developed camping experience consistent with the recreation opportunity spectrum of roaded natural for both the summer and winter seasons which provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use.

# Ashley Lake Campgrounds (GA-SM-MA7-Ashley Lake)

About 15 miles west of Kalispell lies Ashley Lake, a 3,000 acre lake popular for water-based recreational opportunities, such as boating, fishing and swimming. The majority of the shoreline is privately owned. Public access to the lake is provided at three areas on national forest system lands, with facilities for camping, boat launching and day-use activities. There are a total of 11 campsites associated with the three areas along the lake.

The recreation opportunity spectrum setting is roaded natural for both the summer and winter seasons which provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use.

#### Desired Conditions (GA-SM-MA7-Ashley Lake-DC)

- The three sites on Ashley Lake provide visitor access to a quality, water-based recreational experience. Camping opportunities complement the existing developed environment surrounding the lake.
- **O2** Ashley Lake campgrounds and facilities are well maintained, with minimal resource damage resources, and accommodate current use.

#### Objectives (SM-MA7-Ashley Lake-OBJ)

**01** Reconstruct three campgrounds at Ashley Lake within the next 10 years.

## Alternative D: Blacktail-Foys (GA-SM-MA7-Blacktail-Foys)

This area provides summer recreational opportunities including horseback riding, mountain biking, disperse camping, and hiking. The recreation opportunity spectrum setting is roaded natural in the summer season and semi-primitive motorized in the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked with additional areas to travel cross-country.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6c.

### Desired Conditions (GA-SM-MA7-Blacktail Foys-DC)

Non-motorized trails provide summer (July and August) hiking and mountain biking opportunities close to local communities, connecting Blacktail Mountain area to trail systems located on non-federal lands.

### Alternative D: Tally Mountain (GA-SM-MA7-Tally Mountain)

This area provides summer recreational opportunities include horseback riding, mountain biking, disperse camping, and hiking. The recreation opportunity spectrum setting is roaded natural for the summer season and a mixture of semi-primitive motorized and semi-primitive non-motorized for the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically un-groomed but are often signed and marked with additional areas to travel cross-country. Winter semi-primitive non-motorized setting provides solitude and quiet recreation for those accessing the forest on skis, snowshoes, or snow boards. Trails are generally un-groomed and often not marked. Rustic facilities, such as historic cabins, yurts may exist but are rare.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6c.

### Desired Conditions (GA-SM-MA7-Tally Mountain-DC)

Recreational opportunities within the Tally Mountain area are consistent with the desired recreation opportunity spectrum settings of roaded natural for the summer season and a mixture of semi-primitive motorized and semi-primitive non-motorized for the winter season, and provides a diversity of summer non-motorized recreational activities.

# Alternative D: Ingalls Mountain (GA-SM-MA7-Ingalls Mountain)

This area provides summer recreational opportunities, include horseback riding, mountain biking, and motorized. The recreation opportunity spectrum setting is roaded natural for the summer season and semi-primitive motorized in the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6c.

#### Desired Conditions (GA-SM-MA7-Ingalls Mountain-DC)

**01** Motorized trails provide summer (July and August) wheeled motorized trail experience on designated routes

#### Alternative D: Werner-Nicola

This MA7 area is located in both the North Fork and the Salish Mountains Geographic Area. Plan components are found under the North Fork GA section.

# South Fork Geographic Area

### **General Overview**

The South Fork geographic area is the largest on the Flathead National Forest, and encompasses the upper half of the South Fork Flathead River basin. It is bordered by the peaks of the Swan Mountain range to the west and the crest of the Continental Divide to the east, adjacent to the Lewis and Clark National Forest. This geographic area includes the vast, undeveloped area of the Bob Marshall Wilderness and portions of the Great Bear Wilderness, highly variable in topography and elevation. Wide, gently sloped river valley bottom lands contrast with very high, rugged, and steeply sloped mountain peaks and cirque basins, with elevation ranging from 3,600 to over 8,000 feet.

These lands support a great diversity of vegetation types and outstanding habitats for native fish and wildlife species such as grizzly bears, gray wolves, and bull trout. For a map of the biophysical settings see appendix B, figure B-15, and refer to appendix D for a description and acres of the biophysical settings within this geographic area. This geographic area includes all of the Spotted Bear Ranger District, and is entirely in National Forest System lands.

This geographic area is popular for recreational use. It is a focal point for hiking, horseback riding, hunting, fishing, and for river float trips on the Wild and Scenic South Fork of the Flathead River. Many of the visitors to the wilderness utilize outfitter services given the vastness and remoteness.

### **Unique Characteristics**

- The Bob Marshall Wilderness and a portion of the Great Bear Wilderness make up the majority of this geographic area. They are part of the Bob Marshall Wilderness Complex, which includes lands on the Flathead, Lewis and Clark, Lolo, and Helena National Forests. The Bob Marshall Wilderness Complex is part of one of the largest remaining wildland areas in the lower 48 states, containing world-class backcountry and is entirely National Forest System lands.
- There is a popular 110-mile-long driving loop around the Hungry Horse Reservoir that provides access to areas of the reservoir and driving for pleasure opportunities.
- Very large expanses of unroaded lands characterize most of this geographic area, allowing for fire and other natural processes to play a dominant role in the ecosystem.
- The South Fork of the Flathead River, from Youngs Creek to the Hungry Horse Reservoir, is a designated Wild and Scenic River.
- The Meadow Creek and Spotted Bear airstrips are within this geographic area.
- Bent Flat and Trail Creek, two significant, high quality fens located along the Spotted Bear River, harbor numerous rare wetland plant species.
- The Dry Park, Horse Ridge, lower Spotted Bear River, and Danaher to Big Prairie areas provide key winter habitat for elk and other big game species.
- Bull trout migrate from Hungry Horse Reservoir and provide catch and release angling that is found nowhere else in Montana; Westslope cutthroat trout populations are non-hybridized as there are no non-native fish populations.

The Spotted Bear Ranger Station and Big Prairie Ranger Station are seasonally-operating historical facilities. These, along with several backcountry guard stations, 40 miles of operational historic phone

line, and an intricate trail system makes up the Flathead National Forest Backcountry Administrative Facilities Historic District. Table 43 displays the acres identified within each management area for the South Fork Geographic Area.

Table 43. South Fork Geographic Area management area allocation (acres and percent) by alternative

Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent
1a Designated Wilderness	671,650	80%	671,650	80%	671,650	80%
1b Recommended wilderness	27,653	3%	76,624	9%		
2a Designated wild and scenic rivers	16,487	2%	16,487	2%	16,487	2%
2b Eligible wild and scenic rivers	39,968	5%	39,968	5%	39,968	5%
3a Administrative areas	170	<1%	170	<1%	170	<1%
3b Special areas						
4a Research natural areas						
4b Experimental and demonstration forests						
5a Backcountry non-motorized year- round	40,819	5%	7,075	1%	60,289	7%
5b Backcountry motorized year-round, wheeled vehicle use only on designated routes/areas						
5c Backcountry: motorized over-snow vehicle use	7,473	1%	4,114	<1%	14,983	2%
5d Backcountry: wheeled motorized vehicle use only on designated routes/areas						
5a-d Backcountry Total	48,292	6%	11,189	1%	75,271	9%
6a General forest low	6,237	1%	13,414	2%	6,237	1%
6b General forest medium	25,932	3%	9,284	1%	21,531	3%
6c General forest high					4,237	1%
6a-c General forest Total	32,170	4%	22,698	3%	32,006	4%
7 Focused recreation areas	7	<1%	7	<1%	7	<1%

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-SF-DC)

- **01** The 40 miles of operational historic phone line is maintained for continued use for wilderness management.
- **02** The Forest Backcountry Administrative Facilities historic district adjacent to and within the Bob Marshall and Great Bear Wilderness areas provide recognition for national and regional wilderness and land management history.
- **03** The Spotted Bear and Meadow Creek Airstrips provide public and administrative access for small aircrafts.

Lands mapped as winter big game habitat by MFWP in the Dry Park, Horse Ridge, lower Spotted Bear River and Danaher to Big Prairie areas provide desired winter habitat conditions (See appendix C for potential strategies since this will vary on a site specific basis).

Non-native fish populations are absent. Fishing for bull trout and westslope cutthroat trout provide for unique angling opportunities. High mountain lakes contribute to those angling opportunities.

# Objectives (GA-SF-OBJ)

- **01** Annually, maintain 40 miles of the historic phone line.
- **02** Improve 1-2 campgrounds.

# Guidelines (GA-SF-GDL)

Vegetation management activities in the lower Spotted Bear River/Mountain area should maintain sufficient canopy to provide snow intercept cover to meet desired conditions for winter big game habitats, as mapped by Montana Fish, Wildlife, and Parks, and as determined by site-specific analysis.

# Swan Valley Geographic Area

### **General Overview**

The Swan Valley Geographic Area encompasses the entire Swan River basin, as well as extending north into the eastern portion of the Flathead River valley and extending west to encompass a portion of the east shore Flathead Lake. The Flathead Indian Reservation borders the GA to the west, following the shore of Flathead Lake and the Mission Mountains divide. The divide between the Swan River and Clearwater River basins forms the southern border, shared by the Lolo National Forest. The peaks of the Swan Range form the eastern border.

The Flathead River Valley in the northern portion of the GA is mostly non-NFS ownership. A substantial portion (about 28%) of the Swan River watershed is also non-NFS ownership, about half of which is the approximately 61,000 acre Swan River State Forest. Acres in the Swan Valley in private ownership were much higher prior to 2010, when the Forest Service acquired about 45,000 acres of Plum Creek Timber lands through the Montana Legacy Land Donation. Portions of the Swan Lake Ranger District are within this GA.

The Swan River watershed is characterized by a wide valley bottom of flat to rolling, gently sloped terrain, bordered on both sides by rugged mountains jutting up steeply from the valley floor. Elevation ranges from about 3,000 feet at the mouth of the Swan River on the shores of Flathead Lake, to over 8,000 feet on the highest peaks of the Swan Range and Mission Mountains. Terrain, soils, and weather patterns all contribute to the generally high precipitation and productivity of lands within the Swan River valley, when compared to other regions of the Forest. The majority of the warm-moist biophysical settings, the most productive lands that occur on the Forest, are within this GA. Warm-dry biophysical settings also occur on some of the drier aspects and soil types. The high elevations of the Mission and Swan Mountain ranges support a good representation of cold biophysical settings. For a map of the biophysical setting for this geographic area see figure B-16. Refer to appendix D for a description and acres of the biophysical settings within this geographic area.

This geographic area links the Bob Marshall Wilderness Complex and the Mission Mountains Wilderness and is an important connectivity zone for many species of wildlife including grizzly bears. Recreation is a major use within this geographic area, as well as timber management.

#### **Unique Characteristics**

- The Mission Mountains Wilderness is within this geographic area.
- This geographic area contains Swan, Holland, and Lindbergh lakes, which are popular day-use and camping areas.
- The geographic area contains large acreage of riparian habitats, including the most extensive, floristically diverse concentration of peatlands (fens) on the valley floor of this GA.
- This geographic area contains most of the known populations of water howellia, a federally-listed, threatened plant that depends on seasonally drying ponds. Condon Creek Botanical Area supports a significant concentration of water howellia.
- The Swan Valley provides key winter habitat for big game species.
- Swan River Research Natural Area occurs in this geographic area and is managed in partnership with the Nature Conservancy to preserve rare aquatic habitats.
- The Swan Crest Trail (Alpine #7) provides a long stretch of trail on a high mountain ridge.

- A portion of the 15,350 acre Jewel Basin Hiking Area lies within this geographic area, and contains hiking trails without motorized, mechanized, or stock use.
- The Condon Airstrip is an open public airstrip in the Swan Valley.

Table 44 displays the acres identified within each management area for the Swan Valley Geographic Area.

Table 44. Swan Valley Geographic Area management area allocation<sup>a</sup> (acres and percent) by alternative

					<del>, ,</del>		
Management Area	Alt B acres	Alt B percent	Alt C acres	Alt C percent	Alt D acres	Alt D percent	
1a Designated Wilderness	74,703	20%	74,703	20%	74,703	20%	
1b Recommended wilderness	50,847	14%	99,919	27%			
2a Designated wild and scenic rivers							
2b Eligible wild and scenic rivers	10,018	3%	10,018	3%	10,018	3%	
3a Administrative areas	10	<1%	10	<1%	10	<1%	
3b Special areas	2,178	1%	1,249	<1%	4,685	1%	
4a Research natural areas	1,345	<1%	1,345	<1%	1,345	<1%	
4b Experimental and demonstration forests		-		-			
5a Backcountry non-motorized year- round	8,887	2%	2,435	<1%	52,860	14%	
5b Backcountry motorized year-round, wheeled vehicle use only on designated routes/areas	19,272	5%	441	<1%	19,272	5%	
5c Backcountry: motorized over-snow vehicle use	17,899	5%	32,133	9%	18,403	5%	
5d Backcountry: wheeled motorized vehicle use only on designated routes/areas	9,329	3%			9,329	3%	
5a-d Backcountry Total	55,386	15%	35,008	10%	99,865	27%	
6a General forest low	7,227	2%	70,622	19%	7,358	2%	
6b General forest medium	165,383	45%	75,222	20%	91,918	25%	
6c General forest high					73,460	20%	
6a-c General forest Total	172,610	47%	145,844	40%	172,735	47%	
7 Focused recreation areas	3,289	1%	1,711	<1%	3,619	1%	

a. Some MAs overlap, e.g., MA1a designated wilderness may have an overlapping MA2a designated wild and scenic river. Due to dual designations, acre and percentage totals will be greater than the actual land base, and will vary by alternative.

# Desired Conditions (GA-SV-DC)

- Known sites and habitat for the threatened species, which currently includes water howellia (*Howellia aquatilis*) persist over time in special aquatic habitats and backwaters in larger, low elevation valleys (also see FW-DC-PLANTS-01).
- **O2** The Swan Highway (MT 83) from Swan Lake to Holland Lake has vistas to view the Mission Mountains and Swan Range.
- Lands acquired in the Swan Valley provide access to the public while maintaining and improving water quality, wildlife habitat conditions, and water howellia habitat.
- **04** Educational guided services would be provided in the Mission Mountains Wilderness.

- Lands mapped as white-tailed deer winter habitat by MFWP in the Swan Valley, from the Holland Lake area on the south to the Swan Lake State Forest boundary on the north, provide desired winter habitat conditions, including snow intercept cover (see appendix C for potential strategies since this will vary on a site specific basis).
- Of The size, shape and characteristics of forest patches in the Swan Valley form a natural appearing mosaic pattern rather than the straight-edged "checkerboard" pattern resulting from past land ownership and management practices.
- Forests across the valley bottom and foothill landscapes of the Swan Valley are highly diverse in species composition and forest structures, particularly on the productive warm moist biophysical settings and forest/wetland interface areas. In those areas suitable for timber production, most forests are in a condition that facilitates tree growth and vigor, allowing for the development of larger trees of desired species, particularly of fire resistant species
- The extensive and floristically diverse concentration of peatlands and fens within this GA supports sustainable and healthy populations of the plant species or communities associated with this feature. (Also see forestwide and MA 3 plan components for peatlands and fens.)
- The portion of the Seeley Clearwater connectivity area from Condon south to the boundary of the Swan Valley geographic area and the area near the town of Swan Lake (see figure B-54) provide habitat connectivity for wide-ranging wildlife species (e.g., grizzly bear, Canada lynx, and wolverine) moving between the Swan and Mission Mountain Ranges.
- 10 Educational guide service would be provided in the Mission Mountains Wilderness.
- Alternative B and D: Six Mile area provides quality motorized over-snow vehicle use, including late-season use, as well as summer wheeled motorized use, consistent with the desired recreation opportunity spectrum. (Not applicable to alternative C.)
- Habitat conditions and ecological processes support known populations of the carinate mountainsnail on and adjacent to talus slopes in the Swan Valley Geographic Area.

# Objectives (GA-SV-OBJ)

- 01 Complete one vista enhancement project along the Swan Highway (MT 83).
- **02** Improve 1 to 3 campgrounds.
- Out of the total treatment acres across the forest, treat 1,500 to 7,500 acres of young forest (e.g., sapling stands) in the Swan Valley GA to maintain or move towards achieving desired forest composition, structure, forest fuel conditions and landscape patterns, and scenic integrity with a focus on the previously harvested lands recently added to the national forest system.

# Guidelines (GA-SV-GDL)

- In order to provide coordinated management of the Mission Mountains Wilderness, consultation with the Confederated Salish and Kootenai Tribes should occur prior to authorization of new permits.
- Vegetation management activities should maintain sufficient canopy to provide snow intercept cover to meet desired conditions for winter big game habitats, as mapped by Montana Fish, Wildlife, and Parks, and as determined by site-specific analysis.

- Talus slopes with known populations of the carinate mountainsnail should not be used as a gravel or ornamental rock source and immediately adjacent vegetation should not be harvested or sprayed for non-native invasive weeds in order to protect this invertebrate species.
- Vegetation management activities in the Swan Valley, from the Holland Lake area on the south to the Swan Lake State Forest boundary on the north, should maintain sufficient canopy to provide snow intercept cover to meet desired conditions for winter big game habitats on NFS lands, as determined by site-specific analysis.
- To minimize resource impacts while maintaining wilderness character, Glacier, Cold, and Upper Cold Lakes provide day use only opportunities in the Mission Mountains Wilderness.
- For efficient operation of the grazing program, open and active cattle grazing allotments should be closed if the opportunity arises with a willing permittee.

## Swan Valley Management Area 7 Focused Recreation Direction

# Suitability of MA 7 areas in Swan Valley GA (GA-SV-MA7-SUIT)

- **01** The following MA 7 areas are suitable for timber production: Krause Basin, Crane Mountain.
- The following MA 7 areas are not suitable for timber production: Holland Lake Campground, Swan Lake Campground and day-use area, Camp Misery trailhead. Timber harvest or other vegetation management activities may occur to achieve desired conditions for vegetation or for other multiple-use purposes associated with the area (such as public safety and health).
- 03 These areas are suitable for salvage logging
- 04 These areas are suitable for wheeled motorized travel on designated roads, trails and areas.
- For suitability of winter motorized over-snow vehicle use, refer to the motorized over-snow vehicle suitability maps, figures B-03 to B-05.

# **Crane Mountain (GA-SV-MA7-Crane)**

This area is located approximately five miles south and east of the town of Bigfork. Mountain biking is a popular summer use of the area. In addition, there are approximately 43 miles of motorized over-snow vehicle trails, which are also available for Nordic skiing and snowshoeing.

The recreation opportunity spectrum setting for the summer season is roaded natural and semi-primitive motorized for the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b.

### Desired Conditions (GA-SV-MA7-Crane-DC)

A system of trails provides mountain biking opportunities in the Crane Mountain area close to local communities.

**O2** The Crane Mountain groomed motorized over-snow vehicles trail system provides for motorized winter recreation opportunities close to local communities.

### Objectives (GA-SV-MA7-Crane-OBJ)

O1 Construct a mountain bike trail in the Crane Mountain area.

## **Krause Basin (GA-SV-MA7-Krause)**

This area is located in the Krause Creek area in the foothills of the Swan Mountains close to the communities of Kalispell and Bigfork, about 20 miles drive east of Kalispell. It provides about 13 miles of wheeled motorized trail opportunities, which connect to the Alpine 7 motorized trail system along the Swan Divide. This area also provides non-motorized hiking, biking and equestrian recreational opportunities and includes a short and interpretive nature trail through the moist cedar forest type.

The recreation opportunity spectrum setting for the summer season is roaded natural and semi-primitive motorized for the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

Vegetation management activities occur to achieve desired conditions within this MA 7 area, with the expected intensity of vegetation management similar to MA 6b.

### Desired Conditions (GA-SV-MA7-Krause-DC)

- **01** Existing trails provide summer (July and August) wheeled motorized trail experience on designated and signed routes.
- 02 Non-motorized (hiking, mountain biking, and equestrian) trail opportunities are provided.

# Holland Lake Campground (GA-SV-MA7-Holland Lake)

This area encircles Holland Lake in the south end of the Swan Valley. It includes the Holland Lake developed campground and day-use areas, and the Owl Creek Packer Camp. Camping, boating, swimming, horseback riding, fishing, and hiking are popular uses of this area. An interpretive nature trail occurs near the campground. This area also encompasses the popular Holland Falls National Recreation Trail, a 1.6 mile trail that follows the lake shoreline to the base of Holland Falls at the head of the lake. The Holland Lake area is also a popular access point to the trail system in the Bob Marshall Wilderness Complex.

The recreation opportunity spectrum setting for the summer season is roaded natural and semi-primitive motorized for the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

### Desired Conditions (GA-SV-MA7-Holland Lake-DC)

**01** Holland Lake Campground and associated recreational facilities provide quality visitor experiences in a natural setting. Facilities are maintained to standard to protect forest resources and updated as needed to accommodate current and anticipated recreation use.

### Swan Lake Campground and day use area (GA-SV-MA7-Swan Lake)

This campground and day-use area is located about 14 miles south of Bigfork, Montana at the southern end of Swan Lake, near the village of Swan Lake, Montana. The majority of the shoreline of Swan Lake is privately owned; this area provides public access to this 3,300 acre lake. Boating, swimming, camping, fishing, and hiking are popular activities.

## Desired Conditions (GA-SV-MA7-Swan Lake-DC)

**O1** Swan Lake Campground and day-use area provides a quality water-based visitor experience. Facilities are maintained to standard that protects forest resources, and updated as needed to accommodate current and anticipated recreation use.

### Objectives (GA-SV-MA7-Swan Lake-OBJ)

**01** Construct a second public access to Swan Lake.

## Alternative D: Camp Misery Trailhead (GA-SV-MA7-Camp Misery)

This management area 7 encompasses the Camp Misery trailhead, which is a very popular, major access point to the Jewel Basin Hiking Area. The Jewel Basin Hiking Area is a 15,300 acre area maintained exclusively for hiking and camping, characterized by high alpine meadows, lakes and forests. Camp Misery trailhead is in close proximity to Kalispell, Montana and readily accessible by car.

The recreation opportunity spectrum setting for the summer season is roaded natural and semi-primitive motorized for the winter season. Roaded natural provides a natural appearing landscape that supports higher concentrations of use, user comfort and social interactions with a well-defined road system. Facilities are well-maintained to protect forest resources and updated as needed to accommodate current and anticipated recreation use. Winter semi-primitive motorized setting provides opportunities for exploration and challenge in backcountry skiing and snowmobiling opportunities. Routes are typically ungroomed but are often signed and marked with additional areas to travel cross-country.

#### Desired Conditions (GA-SV-MA7-Camp Misery-DC)

Camp Misery trailhead provides quality visitor experiences and facilities in a natural setting. Facilities are maintained to standard to protect forest resources and updated as needed to accommodate current and anticipated recreation use.

# Glossary

The glossary defines terms used throughout the document. If a term's definition(s) is associated with a particular species, management direction, or originates from a specific source, the source is cited or applicable direction is referenced with the following bracketed abbreviations:

- [GBCS] Grizzly Bear Conservation Strategy for the Northern Continental Divide Ecosystem (draft 2013, final in progress).
- [NCDE Food/Wildlife Attractant Storage Orders] one or more special orders related to occupancy and use restrictions for the Northern Continental Divide Ecosystem for grizzly bears
- [LCAS] Lynx Conservation and Assessment Strategy 2013
- [NWCG] National Wildfire Coordinating Group 2013.

For definitions specific to the Northern Rockies Lynx Management Direction see appendix F.

activity area a land area affected by a management activity to which soil quality standards are applied. An activity area must be feasible to monitor and includes harvest units within timber sale areas, prescribed burn areas, grazing areas or pastures within range allotments, riparian areas, recreation areas, and alpine areas. Temporary roads, skid trails, and landings are considered to be part of an activity area.

**adaptive management** the general framework encompassing the three phases of planning: assessment, plan development, and monitoring (36 Code of Federal Regulations (CFR) 219.5). This framework supports decision-making that meets management objectives while simultaneously accruing information to improve future management by adjusting the plan or plan implementation. Adaptive management is a structured, cyclical process for planning and decision-making in the face of uncertainty and changing conditions with feedback from monitoring, which includes using the planning process to actively test assumptions, track relevant conditions over time, and measure management effectiveness.

**administrative site** a location or facility constructed for use primarily by government employees to facilitate the administration and management of public lands. Examples on National Forest System lands include, but are not limited to, ranger stations, warehouses, and guard stations. [GBCS]

**administrative use** a generic term for authorized agency activity. Specifically, in the portion of the Northern Continental Divide Ecosystem (NCDE) for grizzly bears mapped as the primary conservation area, motorized use of roads closed to the public is permitted for federal agency personnel or personnel authorized to perform duties by appropriate agency officials, as long as it does not exceed either 6 trips (3 round trips) per week OR one 30-day unlimited use period during the non-denning season (see also **non-denning season**). [GBCS]

aerial retardant avoidance areas are mapped avoidance areas on NFS lands to protect resources. Avoidance areas include aquatic avoidance areas (minimum of a 300-foot buffer), terrestrial avoidance areas, and cultural resources, including historic properties, traditional cultural resources, and sacred sites. Refer to the Implementation Guide for Aerial Application of Fire Retardant (<a href="www.fs.fed.us/fire/retardant/afr\_handbook.pdf">www.fs.fed.us/fire/retardant/afr\_handbook.pdf</a>) and avoidance area maps <a href="http://www.fs.fed.us/fire/retardant/index.html">http://www.fs.fed.us/fire/retardant/index.html</a>.

**animal unit month** the amount of dry forage required by one mature cow of approximately 1,000 pounds or its equivalent, for one month, based on a forage allowance of 26 pounds per day.

**attractant** a nourishing substance, which includes human food or drink (canned, solid or liquid), livestock feed (except baled or cubed hay without additives), pet food, and garbage. [NCDE Food/Wildlife Attractant Storage Order]

**baseline** the environmental conditions at a specific point in time. The baseline for the NCDE is defined as December 31, 2011, as modified by exceptions specified in the standards or guidelines, and by changes that were evaluated and found to be acceptable through the Endangered Species Act Section 7 consultation with USFWS while the grizzly bear was listed as Threatened. The baseline will be updated to reflect such changes[GBCS].

**bear management subunit** an area of a bear management unit, in the portion of the NCDE for grizzly bears mapped as the primary conservation area, representing the approximate size of an average annual female grizzly bear home range (e.g., 31–68 mi<sup>2</sup> (Mace and Roberts 2012)). [GBCS]

**bear management unit** an area about 400 m<sup>2</sup>, in the portion of the NCDE for grizzly bears mapped as the primary conservation area, that meets yearlong habitat needs of both male and female grizzly bears. [GBCS]

best management practice (BMP) the method(s), measure(s), or practice(s) selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (36 CFR 219.19).

**biodiversity** the variety and abundance of plants, animals, and other living organisms as well as the ecosystem processes, functions and structures that sustain them. Biodiversity includes the relative complexity of species and communities across the landscape at a variety of scales, connected in such a way that provides for the genetic diversity to sustain a species over the long term.

biological assessment a document prepared by a federal agency for the purpose of identifying any endangered or threatened species that is likely to be affected by an agency action. A biological assessment document facilitates compliance with the Endangered Species Act. The federal agency, in consultation with the Secretary of Interior, must ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of its habitat.

biological evaluation a document, or portion of a document, prepared by the Forest Service to review programs or activities to determine how an action might affect a species listed by the U.S. Fish and Wildlife Service as a threatened, endangered, proposed, or candidate species; or a species listed by the Regional Forester as a species of conservation concern on a particular national forest. If the threatened, endangered, or proposed species will be addressed in a biological assessment then the species would not be addressed in a biological evaluation.

**biophysical settings** a grouping of potential vegetation types based on broad climatic and site conditions, such as temperature and moisture gradients. See also **potential vegetation types**.

board foot a unit of measurement represented by a board one foot square and one inch thick.

**boneyard** an established site that is used by a grazing permittee for disposing of entire animal carcasses.

**boreal forest** (lynx) a forest type to which lynx and snowshoe hares are strongly associated. The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir

(*Abies* spp.). At the landscape scale within each region, natural and human-caused disturbance processes (e.g., fire, wind, insect infestations and forest management) influence the spatial and temporal distribution of lynx populations by affecting the distribution of good habitat for snowshoe hares. (USFWS Critical Habitat Final Rule 2009)

**broadcast burn** a management treatment where a prescribed fire is allowed to burn over a designated area within well-defined boundaries. A broadcast burn is used for reduction of fuel hazard, as a resource management treatment, or both.

candidate species a status (1) for U.S. Fish and Wildlife Service candidate species, a species for which the U.S. Fish and Wildlife Service possesses sufficient information on vulnerability and threats to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published by the U.S. Fish and Wildlife Service; (2) for National Marine Fisheries Service candidate species, a species that is: (i) the subject of a petition to list and for which the National Marine Fisheries Service has determined that listing may be warranted, pursuant to section 4(b)(3)(A) of the Endangered Species Act (16 United States Code (U.S.C.) 1533(b)(3)(A)), or (ii) not the subject of a petition but for which the National Marine Fisheries Service has announced in the Federal Register the initiation of a status review

canopy the forest cover of branches and foliage formed by tree crowns.

**canopy base height** the lowest height above the ground at which there is a sufficient amount of canopy fuel to propagate fire vertically into the canopy; canopy base height is an effective value that incorporates ladder fuels such as shrubs and understory trees.

**canopy fuel** the live and dead foliage, live and dead branches, and lichen of trees and tall shrubs that lie above the surface fuels.

**capability** the potential of an area of land and/or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions (climate, slope, landform, soils, and geology), as well as the application of management practices (silviculture systems, or protection from fires, insects, and disease).

**capacity** the number of people that an overnight developed recreation site is designed to accommodate.

capacity of developed recreation (GBCS definition) sites within the NCDE primary conservation area the number of sites available in a campground; or the number of rooms available for lodging; or the number of cabins or bunkhouses available for overnight use by the public. [GBCS]

**carbon pool** an area that contains an accumulation of carbon or carbon-bearing compounds or having the potential to accumulate such substances. May include live and dead material, soil material, and harvested wood products.

**carbon stock** the amount or quantity contained in the inventory of a carbon pool.

**clearcut** a harvest technique: 1) a stand in which essentially all trees have been removed in one operation. *Note*: depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration. 2). An even-aged regeneration or harvest method that removes essentially all trees in a stand (synonym is clearcutting). See also **regeneration method**.

**climax** the final stage of succession in a plant community. A relatively stable condition where plant species on the site are able to perpetuate themselves indefinitely.

#### closed canopy structural stage see stem exclusion structural stage

**coarse woody debris** a piece or pieces of larger sized dead woody material (e.g., dead boles, limbs, and large root masses) on the ground or in streams. Minimum size to be defined as "coarse" is generally 3 inches diameter.

**commercial thinning** a treatment that selectively removes trees large enough to be sold as products, such as sawlogs, poles or fence posts, from an overstocked stand. This treatment is usually carried out to improve the health and growth rate of the remaining crop trees, or to reduce fire hazard.

**commercial use/activity** a use or activity on National Forest System lands (a) where an entry or participation fee is charged, or (b) where the primary purpose is the sale of a good or service, and in either case, regardless of whether the use or activity is intended to produce a profit (36 CFR 251.51).

climate change adaptation an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This adaption includes initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects. Adaptation strategies include the following: building resistance to climate-related stressors; increasing ecosystem resilience by minimizing the severity of climate change impacts, reducing the vulnerability and/or increasing the adaptive capacity of ecosystem elements; facilitating ecological transitions in response to changing environmental conditions.

**cohort** a group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seedling origin and trees that predate the disturbance

**condition class** a function of the degree of departure of an area from historical fire regimes, resulting from alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure.

connectivity the ecological conditions that exist at several spatial and temporal scales that provides landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to climate change (36 CFR 219.19). Connectivity needs vary by species. For example, bull trout are able to move upstream to spawn as long as there is not a barrier to connectivity, such as a dam.

**conservation** the protection, preservation, management, or restoration of natural environments, ecological communities, and species.

**consumptive water use** the act of removing water from an available supply and utilizing it in a manner that it is not returned to a waterbody.

**control** (with respect to invasive species, e.g. plant, pathogen, vertebrate, or invertebrate species) is defined as any activity or action taken to reduce the population, contain, limit the spread, or reduce the effects of an invasive species. Control activities are generally directed at established free-living infestations, and may not necessarily be intended to eradicate the targeted infestation in all cases.

**cover** the elements of the environment used by an animal for hiding. Cover varies depending upon the species or the time of year and may include a variety of vegetation types as well as topography. The amount and quality of cover needed depends on the animal's size, mobility, and reluctance or willingness to venture into relatively open areas.

**cover type** the vegetation composition of an area, described by the plant species forming a plurality of composition. See also **forest type**.

**critical habitat** (for a threatened or endangered species) (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act (ESA) (16 United States Code (USC) 1533), on which are found those physical or biological features (a) essential to the conservation of the species, and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the ESA (16 USC 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. ESA, sec. 3 (5)(A), (16 USC 1532 (3)(5)(A)). Critical habitat is designated through rulemaking by the Secretary of the Interior or Commerce. ESA, sec. 4 (a)(3) and (b)(2) (16 USC 1533 (a)(3) and (b)(2)).

**crown** the part of a tree or other woody plant bearing live branches and foliage.

culmination of mean annual increment of growth see mean annual increment of growth

#### d.b.h. see diameter breast height

decision document a record of decision, decision notice, or decision memo (36 CFR 220.3).

**dedicated skid trail** a pathway used repeated, and only, to move logs or trees from the stump to a landing, where they are processed and loaded onto trucks.

**deferred trail maintenance** the backlog of trails where planned maintenance is not performed on schedule.

**demographic connectivity area** an area intended to allow female grizzly bear occupancy and potential dispersal beyond the NCDE to other recovery areas. [GBCS]

**den emergence time period** the spring-time period when a grizzly bear emerges from its den and remains in the vicinity before moving to lower elevations. The den emergence time period occurs at the beginning of the non-denning season. Females with cubs usually emerge later and spend more time (a few days to a few weeks) near the den after emergence, than do male bears. [GBCS]

**denning season** the typical time period, within the NCDE, during which most grizzly bears are hibernating in dens. There are no restrictions on motorized use related to grizzly bears during the denning season, which occurs [GBCS]:

- West side of the Continental Divide: from 1 December through 31 March.
- East of the Continental Divide: from 1 December through 15 April.

density (stand) the number of trees growing in a given area usually expressed in terms of trees per acre.

designated area an area or feature identified and managed to maintain its unique special character or purpose; some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the federal executive branch; examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas; examples of administratively designated areas are experimental forests, research natural areas, botanical areas, and significant caves.

**designated over-the-snow route** a course managed under permit or agreement or by the agency, where use is encouraged, either by on-the ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition.

**detrimental soil condition** the condition where established soil quality standards are not met and the result is a significant change in soil quality.

**developed recreation site** an area which has been improved or developed for recreation 36 CFR 261.2. A recreation site on NFS lands that has a development scale of 3, 4, or 5.

- Development scale 3 (moderate site modification) where facilities about equal for protection of natural site and user comfort. The contemporary/rustic design of improvements is usually based on use of native materials. Inconspicuous vehicular traffic controls usually provided. And roads may be hard surfaced and trails formalized with the primary access over high standard roads. Development density is about 3 family units per acre. Interpretive services informal if offered, but generally direct.
- Development scale 4 (heavy site modification) where some facilities are designed strictly for comfort and convenience of users and facility design may incorporate synthetic materials. There may be extensive use of artificial surfacing of roads and trails. Vehicular traffic control usually are obvious with the primary access usually over paved roads. Development density is 3-5 family units per acre. Plant materials usually native. Interpretive services, if offered, often formal or structured.
- Development scale 5 (extensive site modification) where facilities are mostly designed for comfort and convenience of users and usually include flush toilets; may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials commonly used. Formal walks or surfaced trails. Access is usually by high-speed highways. The development density 5 or more family units per acre. Plant materials may be non-native. Formal interpretive services usually available. Plant materials may be non-native and mowed lawns and clipped shrubs not unusual.

**dispersed recreation** An area in a National Forest or National Grassland with limited or no amenities provided for recreational users 36 CFR 261.2.

dispersed recreation sites A recreation site on NFS lands that has a development scale of 0 to 2

- Development scale 0 (no site modification) No constructed features evident at the site.
- Development scale 1 (almost no site modification). Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. The use of synthetic materials is excluded. The primary access is usually over primitive roads. The spacing informal and extended to minimize contacts between users.
- Development scale 2 (minimal site modification) Rustic or rudimentary improvements designed primarily for protection of the site rather than the comfort of the users. Use of synthetic materials avoided. Spacing informal and extended to minimize contacts between users. Primary access usually over primitive roads. Any interpretive services are informal, almost subliminal.

**diameter breast height/d.b.h.** the diameter of a tree measured 4.5 feet above the ground on the uphill side of the tree, or diameter of a log measured 4.5 feet from the large end of the log.

**disturbance** an event that alters the structure, composition, or function of terrestrial or aquatic habitats; any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment. Natural disturbances include, among others, drought, floods, wind, fires, wildlife grazing, and insects and pathogens; human-caused disturbances include actions such as timber harvest, livestock grazing, roads, and the introduction of exotic species.

**disturbance regime** a description of the characteristic types of disturbance on a given landscape; the frequency, severity, size, and distribution of these characteristic disturbance types, and their interactions. The natural pattern of periodic disturbances, such as fire or flooding

**disturbance/displacement** the repeated avoidance of humans by a species by shifting its habitat use in space or time.

**dominance type** category of terrestrial plant community representing the most common plant species (such as a tree species) or plant community type (such as grassland or shrubland) that occupies the site. The dominant species or plant community comprises at least 40% of the total species/community abundance (as measured by different methods, depending on data source, e.g. canopy cover, basal area, etc)

driver (ecology) see ecosystem driver.

**duff** a generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

early-seral/successional stage (forest) the earliest stage in the sequence of plant communities that develop after a stand replacing disturbance, such as fire or regeneration harvest. On the forested communities of the Flathead National Forest, this stage typically occurs in the period from 1 to 30 or 40 years after the disturbance, and is dominated by grass, forbs, shrubs, and seedling/sapling sized trees.

**ecological condition** the biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems; ecological conditions include habitat and other influences on species and the environment; examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads and other structural developments, human uses, and invasive species.

**ecological integrity** the quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence. The quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future.

ecological and social characteristics of recommended wilderness areas that provide the basis for suitability for inclusion into the National Wilderness Preservation System are identified for each recommended wilderness area and can be found in appendix 4. Wilderness characteristics are *natural quality, undeveloped, unconfined or primitive recreation or solitude and other features of value.*Oftentimes, the ecological characteristics are discussed in terms of *natural quality* and *undeveloped* and can be represented by landscapes where evidence of human disturbance is not readily apparent or the intactness of an ecosystem. Social characteristics can be discussed in terms of *solitude* or *unconfined or* 

primitive recreation and often represented by remote, quite landscapes where recreation activities such as hiking, climbing, fishing and hunting are predominant. Both the ecological and social characteristics can have *other features of value* such as a cave system (ecological) or cultural resources (social).

#### ecological sustainability see sustainability.

**ecosystem** (36 CFR 219.19) a spatially explicit, relatively homogeneous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. An ecosystem is commonly described in terms of its:

- composition: The biological elements within the different levels of biological organization, from genes and species to communities and ecosystems.
- structure: The organization and physical arrangement of biological elements such as, snags and down woody debris, vertical and horizontal distribution of vegetation, stream habitat complexity, landscape pattern, and connectivity.
- function: Ecological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention, predation and herbivory, and natural disturbances such as wind, fire, and floods.
- connectivity: See **connectivity**.

**ecosystem driver** a natural or human-induced factor that directly or indirectly causes a change in an ecosystem. Examples include climate change, fire events, invasive species and flooding.

### ecosystem resilience see resilience

ecosystem service the benefit(s) people obtain from an ecosystem, including: (1) provisioning services, such as clean air and fresh water, energy, fuel, forage, fiber, and minerals; (2) regulating services, such as long-term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation; (3) supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and (4) cultural services, such as educational, aesthetic, spiritual and cultural heritage values, recreational experiences and tourism opportunities.

**ecosystem stressor** a factor that may directly or indirectly degrade or impair ecosystem composition, structure or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime.

**emergency situation** a circumstance on National Forest System (NFS) lands for which immediate implementation of all or part of a decision is necessary for relief from hazards threatening human health and safety or natural resources on those NFS or adjacent lands; or that would result in substantial loss of economic value to the Federal Government if implementation of the decision were delayed. (36 CFR 215.2)[GBCS]

**endangered species** a species that the Secretary of the Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Endangered species are listed at 50 CFR sections 17.11, 17.12, and 224.101.

**environmental document** a written analysis that provides sufficient information for a responsible official to undertake an environmental review. Examples include: a categorical exclusion, an environmental assessment, and an environmental impact statement.

**epidemic** (outbreak) the rapid spread, growth, and development of pathogen or insect populations that affect large numbers of a host population throughout an area at the same time.

**even-aged stand** a stand of trees composed of a single age class (cohort). Usually trees in a single age class are within +20 years of each other.

**exotic species** a plant or animal species in an areas where they do not occur naturally; a non-native species

**fine fuel** the fast-drying dead or live materials, generally characterized by a comparatively high surface area-to-volume ratio, which is defined as less than 0.25 inches in diameter and having a timelag of 1 hour or less. Fine fuels (grass, leaves, needles, etc.) ignite readily and are consumed rapidly by fire when dry. [NWCG]

### fire control see fire suppression

**fire exclusion** the disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

**fire hazard** the potential fire behavior for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fireline construction. Fire behavior assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

**fire regime** the role of fire in ecosystems and its interactions with dominant vegetation. The periodicity and pattern of naturally occurring fires in a particular area or vegetative type, described in terms of frequency, intensity (heat energy released), severity (ecological effect), seasonal timing, and aerial extent (Anderson 1982). The five natural fire regimes on the Flathead National Forest follow: The five natural fire regimes on the Flathead National Forest follow:

- I 0 to 35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- II 0 to 35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- III 35 to 100+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);
- IV 35 to 100+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);
- V 200+ year frequency and high (stand replacement) severity.

**fire risk** the probability or chance of fire starting determined by the presence and activities of causative agents.

**fire suppression** the work and activities connected with fire extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished.

**fire-adapted species** a plant type that has evolutionary adaptations to survive and thrive in an ecosystem where fire is a primary driver, including tree species that are termed fire-tolerant as well as trees and other plant species that have a myriad of other types of adaptations. Some examples of adaptations are the serotinous cones of lodgepole pine (which open only when heated in a fire); fast early tree growth for

rapid site domination; rhizomatous (below ground) root systems or root crowns; seeds with hard, fire resistant seed-coats; or very lightweight, wind-dispersed seed (see also **fire-tolerant species**).

**fire-intolerant tree species** a tree type that is susceptible to severe damage or mortality in a fire event. Characteristics typically include thin bark at maturity, crowns that retain lower branches (close to the ground), less protected buds and needles. For example, subalpine fir, grand fir and spruce are fire-intolerant species in the Flathead National Forest.

**fire-tolerant tree species** a tree type resistant to severe damage or mortality in a fire event. Characteristics include thick bark at maturity, readily self-pruning (i.e., lower branches are shed as the tree grows), and protected buds. Examples of fire-tolerant species on the Flathead National Forest are western larch, ponderosa pine and, to a lesser extent, Douglas-fir.

**fire severity** the ecological effect of the fire. As used in this Forest Plan, refers to the effect of the fire on the dominant vegetation, which are coniferous trees. Three levels of fire severity are recognized:

- **High severity:** greater than 75 percent of the dominant overstory vegetation (e.g., trees) are killed. Also referred to as stand-replacement fire.
- Moderate severity: 35 to 75% of the dominant overstory vegetation (e.g., trees) are killed.
- Low severity: less than 35% of dominant overstory vegetation (e.g., trees) are killed.

**Mixed severity fire** refers to a fire event or an area where a broad mix of low, moderate and high fire severity burn conditions occur.

**fish passage** a clear access for migrating fish through a potential barrier.

**flame length** the distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity. [NWCG]

**focal species** a small subset of species whose status permits inference to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species would be commonly selected on the basis of their functional role in ecosystems (36 CFR 219.19).

**food/wildlife attractant special order** a legal notice regarding the use and storage of wildlife attractants on National Forest System lands. An example is the "Occupancy and Use Restrictions for National Forest System lands in the Primary Conservation Area, Zone 1 (including the demographic connectivity areas) and Zone 2 of the NCDE on the Flathead, Kootenai, Lewis and Clark, Lolo, and Helena National Forests in Montana, pursuant to 36 CFR 261.50 (a) and (b)."

**forage** the browse and non-woody plants available to livestock or wildlife for feed.

**foraging habitat** (lynx) an area that supports the primary prey (snowshoe hare) of lynx and has the vegetation structure suitable for lynx to capture prey. These conditions may occur in early successional stands following some type of disturbance, or in older forests with a substantial understory of shrubs and young conifer trees. Coarse woody debris, especially in early successional stages (created by harvest regeneration units and large fires), provides important cover for snowshoe hares and other prey. [LCAS]

**forb** a herbaceous (herb-like) plant other than grass or grass-like plants.

forest connectivity an area for wildlife species that prefer to remain within or close to forested cover.

**forest dominance type** a classification that reflects the most common tree species within a forest stand. The dominant species comprises at least 40 percent of the stocking, as measured by canopy cover, basal area, or trees per acre, depending on available information and stand characteristics.

**forest health** the perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance. A useful way to communicate about the current condition of the forest, especially with regard to the ability of the ecosystem to respond to disturbances. *Note*: perception and interpretation of forest health are influenced by individual and cultural viewpoints, land management objectives, spatial and temporal scales, the relative health of the stands that comprise the forest, and the appearance of the forest at a point in time.

**forest land** an area at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest uses. Lands developed for non-forest use include areas for crops, improved pasture, residential or administrative sites, improved roads of any width and adjoining road clearing, and power line clearings of any width.

**forest management** the practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. *Note:* forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values. Forest management varies in intensity from leaving the forest alone, to a highly intensive regime composed of periodic silvicultural treatments.

**forest plan** a document that guides sustainable, integrated resource management of the resources within a plan area and within the context of the broader landscape, giving due consideration to the relative values of the various resources in particular areas (36 CFR 219.1(b)). Consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 United States Code (U.S.C.) 528–531), the Forest Service manages National Forest System lands to sustain the multiple use of its renewable resources in perpetuity while maintaining the long-term health and productivity of the land. Resources are managed through a combination of approaches and concepts for the benefit of human communities and natural resources.

**forest structure** a complex three-dimensional construct consisting of the various horizontal and vertical physical elements of the forest, including tree diameters, tree heights, tree ages, stand density, canopy layers, quantity/quality of deadwood, herbaceous species, and the clumpiness of the stand. There is no one measure to quantify or describe structure. Often individual forest attributes are described and integrated to evaluate forest structure, such as tree sizes or ages or number of canopy layers.

#### forest system road see National Forest System road.

**forest type** a category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees, e.g., subalpine fir/spruce; lodgepole pine.

**fuel management** an act or practice of controlling flammability and reducing resistance to control of wildand fuels through mechanical, chemical, biological or manual means, or by fire, in support of land management objectives. [NWCG]

**fuel model** a set of surface plant material characteristics (e.g., load and surface-area-to-volume-ratio by size class, heat content, and depth) organized for input to a fire model. Standard fuel models (e.g., Anderson 1982) have been stylized to represent specific fuel conditions.

**fuel treatment** a fuel treatment is a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire adapted ecosystems. [NRLMD]

fuelwood a term for wood that is used for conversion to a form of energy (e.g., firewood, biomass).

**geographic area** a spatially contiguous land area identified within the planning area. A geographic area may overlap with a management area (36 CFR 219.19).

**geographic information system** (GIS) a computer process that links database software to graphics (spatially explicit) software and provides database and analytic capabilities.

gradient (stream) the slope of a streambed.

**grazing allotment** a designated area of land that is available for livestock grazing and is represented on a map. A grazing allotment can include National Forest System (NFS) and non-NFS lands. Permits are issued for the use of allotments or portions of allotments. Allotments may be (Forest Service Manual (FSM) 2205):

- active: Livestock grazing allotments, including pack and saddle stock allotments.
- closed: Areas having suitable livestock range that have been closed to livestock grazing by administrative decision or action.
- combined: An allotment that has been combined into another allotment, and therefore, no longer exists as an independent allotment.
- vacant: An allotment that does not have a current grazing permit issued.

**grazing permit in non-use status** a term that applies to livestock numbers. Non-use of a term grazing permit, in whole or in part, must be approved by a Forest Supervisor and is allowed for permittee convenience, resource protection or development, or range research (FSM 2231.7).

**Grizzly Bear Conservation Strategy** a document published by the U.S. Fish and Wildlife Service that describes the regulatory framework for management of the NCDE grizzly bear population and its habitat upon recovery and subsequent removal from the Federal list of Threatened and Endangered Species.

**grizzly bear–human conflict** an interaction between a grizzly bear and human in which bears either do, or attempt to, injure people, damage property, kill or injure livestock, damage beehives, obtain anthropogenic foods or attractants or agricultural crops. [GBCS]

**ground fire** a term used to describe organic material, such as duff, organic soils, roots, and rotten buried logs, burning beneath the surface. [NWCG]

**ground-based logging system** a logging method using tracked or wheeled tractors. These tractors or forwarders typically operate on gentle slopes (e.g., <40%). Steeper slopes may require cable logging systems.

**groundwater-dependent ecosystem** a community of plants, animals, and other organisms whose extent and life processes depend on groundwater. Examples include many wetlands, groundwater-fed lakes and streams, cave and karst systems, aquifer systems, springs, and seeps.

**group selection method** a cutting method to develop and maintain uneven-aged stands by the removal of small groups of trees (generally but not limited to 1 acre or less in size) at periodic intervals to meet a predetermined goal of size distribution and species composition in remaining stands.

**group use** an activity conducted on National Forest System lands that involves a group of 75 or more people, either as participants or spectators (36 CFR 251.51).

**guide** to provide services or assistance (such as supervision, protection, education, training, packing, touring, subsistence, transporting people, or interpretation) for pecuniary remuneration or other gain to individuals or groups on National Forest System lands (36 CFR 251.51).

habitat type an aggregation of plant communities of similar biophysical characteristics, and similar function and response to disturbances. A habitat type will produce similar plant communities at climax. On the Flathead National Forest, habitat types are based upon Pfister et al. 1977. See also **potential vegetation type**.

hazard tree a tree that has the potential to cause property damage, personal injury or fatality in the event of a failure, where failure is the mechanical breakage of a tree or tree part. Failures often result from the interaction of defects, weather factors, ice or snow loading or exposure to wind. Tree hazards may include dead or dying trees, dead parts of live trees, or unstable live trees (due to structural defects or other factors) that are within striking distance of people or property (a target). Defects are flaws in a tree that reduce its structural strength. Trees may have single or multiple defects, which may or may not be detectable. Failures result in accidents only if they strike a target.

**highway** "Highway", "road", and "street", whether the terms appear together or separately or are preceded by the adjective "public", are general terms denoting a public way for purposes of vehicular travel and include the entire area within the right-of-way. [Montana Code Annotated, Title 60-1-103]

historical range of variability the variation in ecological conditions resulting from disturbance regimes and other natural influences under which the ecosystem and forests evolved. Typically refers to the period prior to the dramatic changes in human land uses and patterns beginning with the influx of European-Americans about the mid-1800s. Historical range of variability is considered valuable for providing a context or frame of reference to evaluate current ecosystem conditions and understanding what an ecologically healthy and sustainable condition might look like. See also **natural range of variation**.

home range an area, from which intruders may or may not be excluded, to which an individual animal restricts most of its usual activities.improvement of recreation sites can include but is not limited to, installation/repair of toilets, replacement and/or installation of picnic tables and firerings, alignment of parking spaces, planting of vegetation, installation/replacement of bulletin boards, and installation of food storage boxes.

**infestation** a large number of organisms (e.g., insects, invasive species) that cause substantial impacts (generally considered negative) to an area or resource.

**inherent capability of the plan area** the ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances.

**initial attack** a planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the fire and put it out in a manner consistent with firefighter and public safety and values to be protected.

**Integrated Pest Management (IPM).** A pest (in this context an invasive species) control strategy based on the determination of an economic, human health, or environmental threshold that indicates when a pest population is approaching the level at which control measures are necessary to prevent a decline in the desired conditions (economic or environmental factors). In principle, IPM is an ecologically-based

holistic strategy that relies on natural mortality factors, such as natural enemies, weather, and environmental management, and seeks control tactics that disrupt these factors as little as possible. Integrated pest management techniques are defined within four broad categories: 1) Biological, 2) Cultural, 3) Mechanical/Physical, and 4) Chemical techniques. FSM 2900

**integrated resource management** a means to realize many benefits from a forest or other natural area and assure the renewable benefits are there for future generations. [NWCG]

integrity (ecology) see ecological integrity

**interagency consultation** a process required by Section 7 of the Endangered Species Act whereby federal agencies proposing activities in a listed species habitat confer with the U.S. Fish and Wildlife Service about the impacts of the activity on the species.

**intermediate harvest** a removal of trees from a stand between the time of its formation and a regeneration harvest. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage. A forested stand remains following harvest, though tree density will vary depending on management objectives for the site.

**intermittent stream** a stream that flows only at certain times of the year when it receives water, usually from springs or a surface source such as melting snow.

**invasive species** an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species infest both aquatic and terrestrial areas and can be identified within any of the following four taxonomic categories: plants, vertebrates, invertebrates, and pathogens (Executive Order 13112). All State- and County-listed noxious weeds are considered invasive plants. In addition, other exotic species that are not listed but can successfully out compete native plants and displace native plan communities are termed an invasive species.

**key ecosystem characteristic** the dominant ecological characteristic(s) that describes the composition, structure, function and connectivity of terrestrial, aquatic and riparian ecosystems that are relevant to addressing important concerns about a land management plan. Key ecosystem characteristics are important to establishing or evaluating plan components that would support ecological conditions to maintain or restore the ecological integrity of ecosystems in the plan area.

**ladder fuel** a term to describe plant materials that provide vertical continuity between forest strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease

#### land management plan see forest plan

**landscape** a defined area irrespective of ownership or other artificial boundaries, such as a spatial mosaic of terrestrial and aquatic ecosystems, landforms, and plant communities, repeated in similar form throughout such a defined area (36 CFR 219.19).

**landtype** a unit shown on an inventory map with relatively uniform potential for a defined set of land uses. Properties of soils landform, natural vegetation, and bedrock are commonly components of landtype delineation used to evaluate potentials and limitations for land use.

**late-seral/successional stage (forest)** a late stage in the sequence of plant communities that develops after a disturbance, such as fire or harvest. On the forested communities of the Flathead National Forest, this stage may begin to develop 140 years or more after the disturbance. Forest structures can be very

diverse, with wide range in densities, number of canopy layers and trees sizes. Usually larger trees are dominant (>16 inches diameter breast height).

**linkage** (also **linkage habitat**or **linkage zone**) an area that will support a low density population of a species during certain parts of the year, and that facilitates demographic and genetic connectivity between geographically separate patches of habitat suitable for that species. Linkage areas facilitate movements of an animal (e.g., dispersal, breeding season movements, exploratory movements) beyond its home range. Linkage areas may include sizeable areas of non-habitat and areas influenced by human actions.

**livestock** a type of domestic animal raised for commercial production purposes, e.g., cattle. Small livestock includes animals such as sheep, goats, and llamas.

lynx critical habitat an area designated by the USFWS that provides the physical or biological features essential to the conservation of the Canada lynx (50 CFR Part 402 Federal Register / Vol. 81, No. 28 / Thursday, February 11, 2016 / Rules and Regulations), as described in 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx and Revised Distinct Population Segment Boundary; Final Rule (Federal Register / Vol. 79, No. 177 / Friday, September 12, 2014 / Rules and Regulations).

**lynx habitat in suitable condition** an area within the boreal forest that provides lynx habitat in all seasons. Forest stands may be in various ages or structural stages (i.e., young saplings in stand initiation structural stage, pole-size stands in stem exclusion structural stage, mature multi-story forest) provided that, following a stand-replacing disturbance or treatment that reduced the dense horizontal cover required by snowshoe hares, trees have grown tall enough and dense enough to protrude above the snow and provide food and cover for snowshoe hares and lynx in winter. [LCAS]

**maintain** to keep in existence or continuance of the desired ecological condition in terms of its desired composition, structure, and processes. Depending upon the circumstance, ecological conditions may be maintained by active or passive management or both.

management area a land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous (36 CFR 219.19).

**management system** (timber) an administrative method that includes even-aged stand and uneven-aged stand protocols.

mature multi-story structural stage (forest) a phase characterized by understory reinitiation, resulting in several tree age classes and vegetation layers. Fallen trees may be present, creating gaps in the overstory canopy. In lynx habitat, these stands typically have high horizontal cover from young understory trees and lower limbs of mature trees that reach the ground or snow level. [LCAS]

mature tree a tree which has achieved its maximum or near-maximum mean annual rate of growth in height or diameter.

**MBF/MMBF** (thousand board feet and million board feet, respectively) a specialized unit of measure for the volume of lumber in the United States and Canada. One board foot is the volume of a 1-foot length of a board 1 foot wide and 1 inch thick.

mean annual increment of growth the total increment of increase in volume of a stand (standing crop plus thinning removals) up to a given age divided by that age. Culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, mean annual increment is expressed in cubic

measure and is based on the expected growth of stands, according to intensities and utilization guidelines in the plan.

mechanized travel/mechanical transport a contrivance for moving people or material in or over land, water, or air, having moving parts, that provides a mechanical advantage to the user, and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts (36 CFR 2320.5(3)).

**mesic** a type of habitat that is moderately moist.

**mid-seral/successional stage (forest)** a mid-stage in the sequence of plant communities that develop after a disturbance, such as fire or harvest. On the forested communities of the Flathead National Forest, stands may be considered in this stage from about 40 to 140 years after the disturbance. Stand structure, such as density and number of canopy layers, can vary widely. Dominant tree sizes are typically from 5 to 15 inches diameter breast height.

**mine reclamation** the process of restoring land that has been mined to a natural or economically usable state. Although the process of mine reclamation occurs once mining is completed, the preparation and planning of mine reclamation activities occur prior to a mine being permitted or started.

minerals the Forest Service defines three types of mineral (and energy) resources:

- 1. Locatable minerals: Commodities such as gold, silver, copper, zinc, nickel, lead, platinum, etc. and some nonmetallic minerals such as asbestos, gypsum, and gemstones.
- 2. Salable minerals: Common varieties of sand, stone, gravel, cinders, clay, pumice and pumicite.
- 3. Leasable minerals: Commodities such as oil, gas, coal, geothermal, potassium, sodium phosphates, oil shale, sulfur, and solid leasable minerals on acquired lands.

**mitigate** to avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

**mixed-severity fire/mixed-severity fire regime** a combination of low- to high-severity fire effects within the perimeter of a single fire, or across consecutive events. Mixed-severity fire regimes give rise to unique patch dynamics and ecosystem responses.

**monitoring** a systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships.

**motorized equipment** a machine that uses a motor, engine, or other nonliving power sources. This includes, but is not limited to, such machines as chain saws, aircraft, motorized over-snow vehciles, generators, motorboats, and motor vehicles. It does not include small battery or gas powered hand carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

**motorized route** a National Forest System (NFS) road or NFS trail that is designated for motorized use on a motor vehicle use map pursuant to 36 CFR 212.51

Motorized travel includes both wheeled and over-snow vehicles

**motor vehicle use** the designation of roads, trails, and areas that are open to motor vehicle use as specified in Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 /36 CFR Parts 212, 251, 261, Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule [GBCS].

**moving window analysis** a geographic information system procedure that quantifies the density of roads and trails by incrementally moving a template across a digital map.

multiple use the management of the various renewable surface resources of the National Forest System lands so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output, consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531).

**National Forest System** the National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tennant Act (50 Stat. 525, 7 U.S.C. 1010-1012), and other lands, waters or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system.

**native knowledge** a way of knowing or understanding the world, including traditional ecological and social knowledge of the environment derived from multiple generations of indigenous peoples' interactions, observations, and experiences with their ecological systems. Native knowledge is place-based and culture-based knowledge in which people learn to live in and adapt to their own environment through interactions, observations, and experiences with their ecological system. This knowledge is generally not solely gained, developed by, or retained by individuals, but is rather accumulated over successive generations and is expressed through oral traditions, ceremonies, stories, dances, songs, art, and other means within a cultural context.

**native species** an organism that was historically or is present in a particular ecosystem as a result of natural migratory or evolutionary processes; and not as a result of an accidental or deliberate introduction into that ecosystem. An organism's presence and evolution (adaptation) in an area are determined by climate, soil, and other biotic and abiotic factors.

**natural range of variation** (NRV) the variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. See also historical range of variation (HRV). The NRV (or HRV) is a tool for assessing the ecological integrity and does not necessarily constitute a management target or desired condition. The NRV can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions.

**net change** the difference in a measurement (such as road density) after on-the-ground changes are accounted for pre- and post-project; allows for temporary changes during a project. [GBCS]

**no surface occupancy stipulation** A mineral lease clause which, if attached to a mineral lease, prohibits the lessee from constructing roads, well pads, or otherwise occupying the land surface unless, upon site-

specific review, it is determined by the authorized officer that the requirements of the stipulation can be modified if other less stringent mitigation is determined to be sufficient to protect the other resources.

**non-attainment area** an area within a State that exceeds the national ambient air quality standards.

**non-consumptive water use** the act of removing water from an available supply and utilizing it in a manner that it returns to a waterbody.

**non-denning season** the time period when grizzly bears typically are not hibernating [GBCS]:

- 4. West side of the Continental Divide: from 1 April through 30 November.
- 5. East side of the Continental Divide: from 16 April through 30 November.

**nonpoint source pollution** a discharge from a diffuse source, such as polluted runoff from an agricultural area or precipitation, to a water body.

**Northern Continental Divide Ecosystem** a region identified in the GBCS encompassing about 110,636 sq. km. of western and central Montana, that is one of five areas in the lower 48 states where grizzly bear populations occur.

Northern Continental Divide Ecosystem (NCDE) Coordinating Committee an interagency group that evaluates implementation of the NCDE GBCS, promotes the exchange of data and information about the NCDE grizzly bear population among agencies and the public, and makes recommendations to the management agencies regarding implementation of the NCDE GBCS. Member of the interagency group may include Montana Fish, Wildlife & Parks; U.S. Fish & Wildlife Service; U.S. Park Service; Forest Service; APHIS-Wildlife Services; U.S. Geological Survey; U.S. Bureau of Land Management; Blackfeet Tribe, and the Confederated Salish and Kootenai Tribes. [GBCS]

**noxious weed** a legal term; an exotic plant species established, or that may be introduced in the area, regulated by law, which are typically aggressive, difficult to manage, and invasive. They may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses.

**off-highway vehicle** a motor vehicle designed for, or capable of, cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain (36 CFR 212.1).

**old growth forest** an ecosystem that is distinguished by old trees and related structural attributes. This term is deliberately defined generically, as the use of the term old growth and definitions for old growth vary substantially by ecological regions, forest types, local conditions, literature source, and a host of other factors. In the context of the Flathead National Forest ecosystem the definitions for old growth are those provided within the document titled "Old Growth Forest Types of the Northern Region (Green et al. 1992, and errata 12/11).

**old-growth associated species** the group of wildlife species that is associated with old-growth habitat on the Flathead National Forest.

**old-growth habitat** a community of forest vegetation characterized by a diverse stand structure and composition along with a significant showing of decadence. The stand structure will typically have multistoried crown heights and variable crown densities. There are a variety of tree sizes and ages ranging from small groups of seedlings and saplings to trees of large diameters exhibiting a wide range of defect and breakage both live and dead, standing and down. The time it takes for a forest stand to develop into an old-growth habitat condition depends on many local variables such as forest type, habitat type, and climate. Natural chance events involving forces of nature such as weather, insect, disease, fire, and the

actions of man also affects the rate of development of old-growth stand conditions. Old-growth habitat may or may not meet the definition for old growth forest (Green et al 1992).

**open motorized route density** a moving window analysis calculation that applies to the primary conservation area portion of the NCDE and includes Federal, State, and Tribal roads and motorized trails that are open to wheeled motor vehicle use by the public for any part of the non-denning season. *Note:* Motorized routes closed only by sign or order are considered to be open for purposes of this calculation. [GBCS] See also **moving window analysis**.

**opening** (as pertaining to maximum opening size standard for timber harvest) a forest patch in a seedling/sapling size class (average stand diameter breast height is less than 5 inches) created as a result of one even-aged harvest operation (i.e., clearcut, seedtree or shelterwood seed cutting). Legacy or reserve trees left to meet other desired conditions are not counted in the calculation of size class for determining the seedling/sapling classification. Adjacent seedling/sapling stands created as a result of an earlier harvest operation are not considered part of an opening.

**outfitting** to rent on, or deliver to, National Forest System lands for pecuniary remuneration or other gain any saddle or pack animal, vehicle, boat, camping gear, or similar supplies or equipment (36 CFR 251.51).

**over snow motorized use** an activity involving a motor vehicle that is designed for use over snow and that runs on a track or tracks and/or a ski or skis, while in use over snow (36 CFR 212.1, Definitions).

**over snow standard season** the time period for over snow motorized use. Generally, the season is defined as December 1 to March 31 of each year; however exceptions apply in specific areas and are noted at the applicable locations as well as in Over Snow Vehicle Use Maps for the Flathead National Forest.

**overstory** the portion of the trees that form the uppermost canopy layer in a forest of more than one story.

**passive crown fire** a type of fire in which individual or small groups of trees torch out, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching and candling.

**patch** an area distinguished from its surroundings by environmental discontinuities, such as a small area of early seral/successional forest (seedling/sapling size class) surrounded by mid-seral and late-seral/successional forest (small to large tree size classes).

**perennial** a stream that flows continuously throughout most years and whose upper surface generally stands lower than the water table in the region adjoining the stream.

**permit** a special use authorization which provides permission, without conveying an interest in land, to occupy and use National Forest System land or facilities for specified purposes, and which is both revocable and terminable (36 CFR 251.51).

**Phenotypically blister-rust resistant** having the appearance of being genetically resistant to blister rust, a non-native disease affecting all five-needled pines (western white pine and whitebark pine on the FNF). This does not mean the tree must be completely free of any observable blister rust infections, but infections should be relatively minor.

**plan** a document, or set of documents, that provides management direction for an administrative unit of the National Forest System developed under the requirements of the 2012 planning rule or a prior planning rule. See also **forest plan**.

plan area the National Forest System lands covered by a forest plan.

**point source pollution** a discharge from a known pollutant source, such as a sewage treatment plant, to a water body from a single location.

pole a tree at least 5 inches diameter breast height (d.b.h.) and smaller than 8 inches d.b.h.

potential vegetation type/potential vegetation group an assemblage of habitat types on the basis of similar biophysical environments, such as climate, slope and soil characteristics. This biophysical environment influences the vegetation characteristics and ecosystem processes that occur. The vegetation communities and conditions that would develop over time given no major natural or human disturbances (i.e., the climax plant community) would be similar within a particular potential vegetation type classification.

**precommercial thinning** the selective felling, deadening, or removal of trees in a young stand dominated by trees less than 5 inches diameter breast height. Primary purposes for thinning include to accelerate diameter increment on the remaining stems, to maintain a specific stocking or stand density range, to develop desired tree species composition, and/or to improve the vigor and quality of the trees that remain.

**prescribed burning or prescribed fire** a fire ignited via management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements (where applicable) must be met, prior to ignition. [NWCG]

**prevention** prevention measures for invasive species management programs include a wide range of actions and activities to reduce or eliminate the chance of an invasive species entering or becoming established in a particular area. Preventative activities can include projects for education and awareness as well as more traditional prevention activities such as vehicle/equipment cleaning, boat inspections, or native plant restoration plantings. Restoration activities typically prevent invasive species infestations by improving site resilience, and reducing or eliminating the conditions on a site that may facilitate or promote invasive species establishment. FSM 2900

**primary conservation area** (PCA) an area identified in the NCDE GBCS to be managed as a source area for the grizzly bear population, where continuous occupancy by grizzly bears would be maintained. Habitat within the PCA would receive the most stringent protection. The PCA is the same area as the NCDE Grizzly Bear Recovery Zone identified in the Grizzly Bear Recovery Plan (<a href="http://www.fws.gov/mountain-prairie/species/mammals/grizzly/">http://www.fws.gov/mountain-prairie/species/mammals/grizzly/</a> (U.S. Fish and Wildlife Service 1993)

**productivity** the capacity of National Forest System lands and their ecological systems to provide the various renewable resources (such as timber) in certain amounts in perpetuity. In land management, productivity is an ecological term, not an economic term.

projected timber sale quantity (PTSQ) the estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity (PWSQ), the projected timber sale quantity includes volume from timber harvest for any purpose from lands in the plan area based on expected harvests that would be consistent with the plan components. The PTSQ is also based on the planning unit's fiscal capability and organizational capacity. PTSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

projected wood sale quantity (PWSQ) the estimated quantity of timber and other wood products that is expected to be sold from the plan area for the plan period. The PWSQ consists of the projected timber sale quantity as well as other woody material such as fuelwood, firewood, or biomass that is also expected to be available for sale. The PWSQ includes volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components. The PWSQ is also based on the planning unit's fiscal capability and organizational capacity. PWSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

**project** an organized effort to achieve an outcome on National Forest System lands identified by location, tasks, outputs, effects, times, and responsibilities for execution (36 CFR 219.19).

**project** (in grizzly bear habitat in the NCDE) a project in grizzly bear habitat in the NCDE, for purposes of the motorized access standards and guidelines in the primary conservation area of the NCDE, refers to any temporary activity requiring construction of new roads, temporary roads, reconstruction or opening of restricted roads during the non-denning season, if such use exceeds administrative use levels (see **administrative use**). Activities involving recurring helicopter use (see **recurring helicopter use**) are also considered to be a project. [GBCS]

**proposed action** a project, activity, or action that a federal agency aims to implement or undertake, and which is the subject of an environmental analysis. Proposed action is a specific term defined under the National Environmental Policy Act.

**proposed species** a type of animal or plant that is proposed by the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service, through the Federal Register to be listed for protection under Section 4 of the Endangered Species Act.

**public involvement** a process designed to broaden the information base upon which agency decisions are made. The process involves informing the public about Forest Service activities, plans, and decisions, and participation in the planning processes which lead to final decision making.

#### rate of spread see spread rate

**reach** a length of stream channel, lake, or inlet exhibiting, on average, uniform hydraulic properties and morphology.

**rearing habitat** a stable and protected micro-environment for a species to birth and rear their young. For example, for juvenile westslope cutthroat trout, rearing habitat is primarily the pool environment found in streams.

**recovery** the improvement in the status of a listed species to the point at which listing as federally endangered or threatened is no longer appropriate (36 CFR 219.19). This definition is for the purposes of the land management planning regulation at 36 CFR part 219 and Land Management Planning Handbook 1909.12, and with respect to threatened or endangered species.

**recovery plan** a document that details actions or conditions necessary to promote improvement in the status of a species listed under the Endangered Species Act, to the point at which listing is no longer appropriate.

**recreation** the set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations. See also **sustainable recreation.** 

**recreation event** a recreational activity conducted on National Forest System lands for which an entry or participation fee is charged, such as animal, vehicle, or boat races; dog trials; fishing contests; rodeos; adventure games; and fairs.

**recreation opportunity** the opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue. Recreation includes non-motorized, motorized, developed, and dispersed recreation on land, water, and in the air.

recreation opportunity spectrum is a classification tool used to provide visitors with varying challenges and outdoor experiences and provides a framework for defining the types of outdoor recreation opportunities the public might desire, and identifies that portion of the spectrum a given National Forest might be able to provide. Travel management decisions are separate, project-level decisions that determine the specific areas and routes for motorized recreation consistent with areas identified in the plan as suitable for motorized recreation use. Just because an area is suitable for motorized use, does not mean motorized use is allowable everywhere in that setting.

**recreation setting** the social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. See also **recreation opportunity**.

- 1. **primitive** the primitive recreational opportunity spectrum setting is large, remote, wild, and predominately unmodified landscapes. There is no motorized activity and little probability of seeing other people. Primitive settings are managed for quiet solitude away from roads, people, and development. There are few, if any facilities or developments. Most of the primitive settings coincide with designated wilderness boundaries and recommended wilderness areas.
- semi-primitive non-motorized the semi-primitive non-motorized settings include areas of the forest
  managed for non-motorized use. Mountain bikes and other mechanized equipment are often present.
  Rustic facilities are present for the primary purpose of protecting the natural resources of the area.
  These settings are not as vast or remote as the primitive settings, but offer opportunities for
  exploration, challenge, and self-reliance.
- 3. semi-primitive motorized the semi-primitive motorized settings area(s) of the forests are managed for backcountry motorized use on designated routes or areas. Routes are designed for off highway vehicles and other high clearance vehicles. This setting offers visitors motorized opportunities for exploration, challenge, and self-reliance. Mountain bikes and other mechanized transport are also sometimes present. Rustic facilities are present for the primary purpose of protecting the natural resources of the area or providing portals to adjacent areas of primitive, or semi-primitive, non-motorized areas.
- 4. **roaded natural** the roaded natural setting is managed as natural appearing with nodes and corridors of development that support higher concentrations of use, user comfort, and social interaction. The road system is well defined and can typically accommodate sedan travel. System roads also provide easy access to adjacent in semi-primitive motorize, semi-primitive non-motorized and primitive areas.
- 5. **rural** the rural settings represent the most developed recreation sites and modified natural settings Facilities are designed primarily for user comfort and convenience.
- 6. **urban** the urban setting is characterized by a substantially developed environment although the background may have natural appearing elements. Highly developed ski areas and resorts are examples of an urban setting on National Forest System lands.

recreation site refer to developed recreation and dispersed recreation

recreation site a defined, public recreation area. The Forest Service uses two categories for recreation sites: dispersed and developed. Both types may have improvements needed to protect resources such as signs, road closure devices, bear resistant food storage devices, and/or sanitation facilities. Some recreation sites are designed and managed for overnight use and some are designed and managed for day-use only (e.g. interpretive signs at roadside pull-outs; trailheads at roadside pull-outs or at road closures; picnic areas or boat launches that are closed at night; ski areas that do not have overnight lodging). [GBCS]

**developed sites** have agency improvements made out of manmade materials that are intended to provide for public recreation and user comfort/convenience. Examples on National Forest Service lands include, but are not limited to: ski areas, campgrounds, sites with cabins, huts, lodges, recreation residences, visitor centers, and trailheads. GBCS management direction applies to developed recreation sites. [GBCS]

**dispersed sites** have minimal to no agency improvements made out of manmade materials. Dispersed sites may include outfitter camps or other primitive camping spots along a road, trail, water body, or at a road closure. [GBCS]

**recurring helicopter use** a type of helicopter flight that involves multiple trips/passes each day consisting of low-altitude (< 500 m above-ground-level) flights that continues for a duration longer than 48 consecutive hours. [GBCS]

**reforestation** the renewal of forest cover by planting, seeding, and natural means (such as seed from existing trees on the site).

**regeneration** the renewal of a forest, whether by natural or artificial means. Natural regeneration creates a new generation (age class) of trees by natural seeding, sprouting, suckering, or layering. Artificial regeneration creates a new age class of trees by planting or seeding (by hand, helicopter, etc). This term may also apply specifically to the new generation of trees on a site.

**regeneration harvest** the cutting of trees and creation of an entirely new age class; an even-age or uneven-aged harvest. The primary methods used for regeneration harvest are clearcutting, seed tree, shelterwood, and group selection cuts.

**regeneration method** the cutting approach used to regenerate a stand. Example methods include clearcut, seedtree, and shelterwood cutting methods.

**resilience** (ecology) the capacity of a (plant) community or ecosystem to maintain or regain normal function and development following disturbance.

**resource selection function** the relative probability of an animal using a unique set of habitat (landscape) characteristics. For studies involving radio-collared animals, "use" of landscape combinations is compared to the "availability" of those combinations in a designated study area.

**restoration** the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed; ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions (36 CFR 219.19).

**riffle** a shallow rapid where the water flows swiftly over completely or partially submerged obstructions (rocks, etc.) to produce surface agitation, but standing waves are absent.

**riparian area** a three-dimensional ecotone of interaction that include terrestrial and aquatic ecosystems that extend into the groundwater, above the canopy, and outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths.

**riparian ecosystem** a transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. A riparian ecosystem is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.

riparian management zone see FW-STD-RMZ-01 in chapter 2.

**riparian wildlife habitat** an environment that occurs along lakes, rivers, streams, springs, and seeps where the vegetation and microclimate are influenced by year-round or seasonal water and associated high water tables. Plant and animal species in these areas are more productive and diverse than on nearby uplands, making these areas very important to many wildlife species.

**road** a motor vehicle route more than 50 inches wide, unless identified and managed as a trail. (36 CFR 212.1, FSM 7705):

- 1. decommissioned: The stabilization and restoration of an unneeded road to a more natural state (36 CFR 212.1). Decommissioned roads do not count towards Total Motorized Route Density as long as they meet the definition of impassable.
- 2. forest road or trail: A route wholly or partly within or adjacent to and serving the National Forest System (NFS) that is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 CFR 212.1 Definitions)
- 3. impassable: A road that has been treated in such a manner that the road is blocked and there is little resource risk if road maintenance is not performed on a regular basis (self-maintaining). These roads are not counted in the total motorized route density as long as the road (generally the first 50 to 300 feet) has been treated to make it inaccessible to wheeled motorized vehicles during the non-denning season. Roads may become impassable as a result of a variety of means, including but not limited to one or more of the following: natural vegetation growth, road entrance obliteration, scarified ground, fallen trees, boulders, culvert or bridge removal, etc. Impassable roads may remain on the inventoried road system if use of the road is anticipated at some point in the future. Some, but not all, roads placed in intermittent stored service may be impassable. [GBCS]
- 4. intermittent stored service/intermittent service road, closed to traffic: The road is in a condition that there is little resource risk if maintenance is not performed. Also see road maintenance level 1 below.
- 5. maintenance level: A term for the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (Forest Service Handbook 7709.59, 62.32)
  - Level 1: These are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns.
  - Level 2: Assigned to roads open for use by high clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations.

Level 3: Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities

Level 4: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds

Level 5: Assigned to roads that provide a high degree of user comfort and convenience.

- 6. National Forest System: A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county, or other local public road authority (36 CFR 212.1)
- 7. temporary: A road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road and that is not included in a forest transportation atlas (36 CFR 212.1). In the NCDE primary conservation area, temporary roads will meet the definition of impassable when no longer needed. [GBCS]

#### roadless characteristics

- High quality or undisturbed soil, water, and air. Source of public drinking water. Diversity of
  plant and animal communities. Habitat for threatened, endangered, candidate, proposed and
  sensitive species on large areas.
- Natural appearing landscapes with high or very high scenic integrity.
- Primitive, semi-primitive non-motorized and semi-primitive motorized recreation opportunity classes of dispersed recreation.
- Other locally identified unique characteristics. Traditional cultural properties and scared sites.

**rotation** the number of years (including the regeneration period) required to establish and grow timber under an even-aged management system to a specified condition or maturity for regeneration harvest.

**running average** a method for computing the average of a stream of numbers for a specified period. A 10-year running average computes the mean for the values in the current year plus the previous 9 years. A running average is commonly used with time series data to smooth out short-term fluctuations and highlight longer-term trends or cycles. [GBCS]

salvage harvest a commercial timber sale of dead, damaged, or dying trees. The harvest recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.

**sapling** a young tree that is larger than a seedling but smaller than a pole or small tree; typically 5 to about 25 feet tall and 1 to 5 inches diameter breast height.

**sawtimber** a collection of logs cut from trees with minimum diameter (typically greater than 6 or 7 inches diameter breast height) or trees of the same minimum diameter and of sufficient length and stem quality suitable for conversion to lumber.

**scarification** the removal of the surface organic material (duff) of an area, typically to prepare the site for reforestation.

**scenic character** a combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place; scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity.

**scenic integrity level** Scenic integrity objective are developed in coordination with the recreational settings, managerial direction and the scenic class that were developed from the scenic inventory.

Very High Integrity – the valued scenery appears natural or unaltered. Only minute visual disturbances to the valued scenery, if any, are present

High Integrity – the valued scenery appears natural or unaltered, yet visual disturbances are present; however, they remain unnoticed because they repeat the form, line, color, texture, pattern and scale of the valued scenery

Moderate Integrity – the valued scenery appears slightly altered. Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern and scale.

Low Integrity – the valued scenery appears moderately altered. Visual disturbances are co-dominant with the valued scenery, and may create a focal point of moderate contrast. Disturbances may reflect, introduce or "borrow" valued scenery attributes from outside the landscape being viewed.

**scheduled timber harvest** Commercial timber harvest that is planned and conducted using a rotation age (the age planned to harvest timber into the future). Rotation age is determined based on site productivity, site conditions, and forest plan desired conditions. Timber harvest is only scheduled on lands suitable for timber production.

**scion** a detached living portion of a plant, such as a bud or shoot, often a branch tip, that is grafted onto the root-bearing part of another plant.

secure core (grizzly bear) an area of the NCDE primary conservation area more than 500 meters from a route open to wheeled motorized use during the grizzly bear non-denning season and that is greater than or equal to 2,500 acres in size. Roads restricted with physical barriers (not gates), decommissioned roads, impassable roads, temporary roads, over-the-snow motorized routes/areas, and non-motorized trails are allowed within secure core, unless otherwise restricted (e.g., by other national forest plan direction). [GBCS]

**security habitat** an area with low levels of human disturbance or habitat that allows a wildlife species to remain in a defined area despite an increase in stress or disturbance. The components of security habitat can include vegetation, topography, the size of the patches of vegetation, road density, distance from roads, intensity of the disturbance, and seasonal timing of the disturbance. This general definition covers most uses of the term security habitat, except for elk and grizzly bear, which have specific definitions.

security habitat (elk) the forested stands on National Forest Service lands at least 250 acres in size greater than 0.5 mile away from open motorized routes during the hunting season. Elk security habitat is calculated at the project level.. Roads that are not open to the public for motorized use during the hunting season are not included in this calculation. The effects of non-motorized use and/or administrative motorized use of closed or temporary roads during the hunting season are not included in this calculation and would instead be analyzed separately at the project level.

**sediment** solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

**seedling** a young tree that has just germinated but has not yet reached sapling size, typically 1 to 5 feet tall.

**seedling/sapling** a size category for forest stands in which trees less than 5 inches in diameter and less than about 25 feet tall are the predominant vegetation.

**seedtree method** a cutting technique used to regenerate a stand in which nearly all trees are removed from an area, except for a small number of trees that are left singly or in small groups.

**seedtree with reserves** the application of the seedtree method with the intention of retaining or reserving all or a portion of the seed trees for future stand structure.

**selection method** a cutting technique used to regenerate a forest stand and maintain an uneven-aged structure, by periodically removing some trees within multiple size classes either singly or in small groups or strips.

**seral** a biotic community that is developmental; a transitory stage in an ecologic succession.

**seral/structural stage** a phase of development of an ecosystem in ecological succession from a disturbed, relatively unvegetated state to a complex, mature plant community.

**severity** the ecological effects of fires, usually on the dominant organisms of the ecosystem, such as the trees.

**shade-intolerant** a plant species that does not germinate or grow well in shaded conditions or dies from the effects of too much shade.

**shade-tolerant** a plant species that can germinate and grow successfully in the shade of other plants.

**shelterwood method** a cutting technique used to regenerate an even-aged stand in which some of the trees are left to provide protection for regeneration (greater numbers of trees may be left in this method than with the seedtree method). This technique may be performed uniformly throughout the stand, in strips, or in groups. Regeneration may be natural or artificial (planting).

**shelterwood with reserves** the application of the shelterwood cutting technique with the intention of retaining or reserving all or a portion of the shelterwood trees for future stand structure.

**silvicultural diagnosis** the compiling, summarizing, evaluation and analyzing of forest stand and/or landscape data. Includes describing desired conditions, interpreting management direction and determining feasible alternative silvicultural systems and initial treatments. Integrates other resource conditions and considerations, such as soils, wildlife habitat and visual sensitivity.

**silvicultural prescription** a written document that describes management activities needed to implement one or more silvicultural treatments, or a treatment sequence. The prescription documents the results of the analysis during the diagnosis phase.

**silvicultural system** a management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes cultural management practices performed during the life of the stand, such as regeneration cutting, thinning, and use of genetically improved tree seeds and seedlings to achieve multiple resource benefits.

**silviculture** the theory and practice of controlling the establishment, composition, growth, and quality of forest stands in order to achieve the objectives of management.

**site preparation** a general term for a variety of activities that remove competing vegetation, slash, and other debris that may inhibit the reforestation effort.

**site productivity** the combined effect of physical and climate properties, soil depth, texture, nutrient load, precipitation, temperature, slope, elevation, and aspect, on tree growth of a specific area of land.

**ski area** a site and attendant facilities expressly developed to accommodate alpine or Nordic skiing and from which the preponderance of revenue is generated by the sale of lift tickets and fees for ski rentals, for skiing instruction and trail passes for the use of permittee-maintained ski trails. A ski area may also include ancillary facilities directly related to the operation and support of skiing activities (36 CFR 251.51).

**skid trail** a trail through the woods used to access timber for skidding (dragging) to a landing with mechanized equipment (i.e., rubber tired skidder) for loading on log trucks.

**slash** the residue left on the ground after felling and other silvicultural operations, or that has accumulated there as a result of storms, fire, or natural pruning.

small livestock: see livestock

snag a standing dead tree usually greater than 5 feet in height and 6 inches in diameter breast height.

**snow intercept cover** a forest canopy which lessens the snow depths for wintering big game animals so that they can forage and travel about.

snowshoe hare habitat an area within boreal and upper montane forest in North America with cold, moderately deep winter snowpack and dense horizontal cover in the understory. During the winter, hares are restricted to areas where young trees or shrubs grow densely (thousands of woody stems per hectare) and are tall enough to protrude above the snow during winter, or where numerous overhanging boughs of mature conifer trees touch the snow surface, providing cover and browse. Winter snowshoe hare habitat develops primarily in the later phase (15 to 40 years post-disturbance) of stand initiation structural stage and in multi-story mature stands. [LCAS] Snowshoe hare habitat is defined at the scale of a forest stand which is a minimum of 5 acres, consistent with the minimum home range size of a snowshoe hare in northwest Montana.

spread rate/rate of spread a measure of the final headfire extent (in the direction of maximum spread).

**stand** a community of trees occupying a specific area and sufficiently uniform in canopy composition, age, and size class to be a distinguishable unit, forming a single management entity.

**stand-replacing disturbance** an agent such as fire, blowdown, insect or disease epidemic, or timber harvest, which kills or removes enough trees (usually considered 80% or more of the tree component) to result in an early seral/successional forest.

**stocking** a measure of timber stand density as it relates to the optimum or desired density to achieve a given management objective.

stressor (ecology) see ecosystem stressor

**structural stage** a particular forest condition, characterized by a set of forest structural characteristics (such as tree diameters, tree heights, tree densities, canopy layers) that is representative of a particular period of stand development. See also **stand initiation structural stage**, **stem exclusion structural stage**, and **understory reinitiation structural stage**.

structure see forest structure

**substrate** a mineral and/or organic material that forms the streambed (i.e., stream bottom).

**subwatershed** a 6<sup>th</sup> code hydrologic unit, as defined in the U.S. Geological Survey hierarchical system of watersheds.

succession/successional stage a predictable process of changes in structure and composition of plant and animal communities over time. Conditions of the prior plant community or successional stage create conditions that are favorable for the establishment of the next stage. The different stages in succession are often referred to as "seral," or "successional" stages.

**suitability of lands** a determination that specific lands within a plan area may be used, or not, for various multiple uses or activities, based on the desired conditions applicable to those lands. The suitability of lands determinations need not be made for every use of activity, but every plan must identify those lands that are not suitable for timber production

**summer range** a part of the overall range of a species where the majority of individuals are located between spring green-up and the first heavy snowfall; in some areas winter range and summer range may overlap.

sustainability the capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. For purposes of this part, "ecological sustainability" refers to the capability of ecosystems to maintain ecological integrity; "economic sustainability" refers to the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits; and "social sustainability" refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another, and support vibrant communities (36 CFR 219.19).

**sustainable recreation** the set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations.

sustained yield limit (SYL) the amount of timber, meeting applicable utilization standards, "which can be removed from [a] forest annually in perpetuity on a sustained-yield basis" (NFMA at section 11, 16 USC 1611; 36 CFR 219.11(d)(6))). It is the volume that could be produced in perpetuity on lands that *may be suitable* for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity. The SYL is not a target but is a limitation on harvest, except when the plan allows for a departure.

#### system road see National Forest System road.

**threatened species** a species that the Secretary of the Interior or the Secretary of Commerce has determined is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act. Threatened species are listed at 50 CFR sections 17.11, 17.12, and 223.102.

**timber harvest** the removal of trees of sufficient size and quality that furnish raw material for wood fiber and for other multiple-use purposes (36 CFR 219.19).

**timber production** the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR 219.19).

**torching index** the open wind speed (measured or forecasted for a standard height (6.1-m) above the tallest vegetation) at which crown fire activity can initiate for the specified fire environment.

**total maximum daily load** (TMDL) a TMDL is the maximum amount of a pollutant a watershed can receive and still meet water quality standards. See appendix E: Watershed Condition Framework and Priority/Watershed Conservation Network for additional information on TMDLs.

**total motorized route density** a moving window analysis calculation that applies to the primary conservation area portion of the NCDE and includes Federal, State, and Tribal roads and motorized trails that do not meet the definition of an impassable road. [GBCS] See also **moving window analysis**.

**trail** a route 50 inches or less in width or a route over 50 inches wide that is identified and managed as a trail (36 CFR 212.1).

**trail class** the prescribed scale of development for a trail, representing its intended design and management standards.

**underburning** a fire that consumes surface fuels but not trees and some large shrubs.

**understor**y the trees and other woody species which grow under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

**utilization standards** utilization standards are specifications for merchantable forest products offered in a timber sale.

**untrammeled** a term defined in the context of the Wilderness Act as an area where human influence does not impede the free play of natural forces or interfere with natural processes in the ecosystem.

**valid existing rights** a legal interest that attaches to a land or minerals estate that cannot be divested from the estate until the interest expires or is relinquished.

**vegetation management** a process that changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. **viable population** a population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments. (36 CFR 219.19)

**viewshed** the visible portion of the landscape seen from viewpoints. Viewpoints can include residences, recreational facilities, and travelways.

water quality the physical, chemical, and biological properties of water.

water yield the runoff from a watershed, including groundwater outflow.

watershed a region or land area drained by a single stream, river, or drainage network; a drainage basin.

watershed condition the state of a watershed based on physical and biogeochemical characteristics and processes.

weighted average/weighted mean similar to an arithmetic mean or average, where instead of all data points contributing equally to the final average, some data points contribute more than others. In the example of patch sizes of early successional seedling/sapling forests, the data point is the patch. Patches are "weighted" by their acreage, and thus larger patches will contribute more to the determination of

average than the smaller patches. This statistic gives insight into how large the largest patches really are, and how the individual patches are distributed along the range from smallest to largest patch size.

wetland an area that under normal circumstances has hydrophytic vegetation, hydric soils, and wetland hydrology.

wheeled motorized travel is motorized use using a wheeled motorized vehicle on terra

wild and scenic river a waterway designated by Congress as part of the National Wild and Scenic Rivers System, which was established in the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271, 1271–1287).

wilderness an area of land designated by Congress as part of the National Wilderness Preservation System that was established in the Wilderness Act of 1964 (16 U.S.C. 1131–1136).

wilderness characteristics are undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features of value.

wilderness character are untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation and other features and values.

Untrammeled. Wilderness is essentially unhindered and free from modern human control or manipulation.

Naturalness. Wilderness ecological systems are substantially free from the effects of modern civilization.

Undeveloped. Wilderness is essentially without permanent improvements or modern human occupation.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation. Wilderness provides outstanding opportunities for people to experience solitude or primitive and unconfined recreation, including the values of inspiration and physical and mental challenge.

Other Features of Value. Wilderness may contain ecological, geological, or other features of scientific educational, scenic, or historical value.

wildland fire a non-structure fire, other than prescribed fire, that occurs in the wildland. Any fire originating from an unplanned ignition.

wildland-urban interface a term is defined by the Healthy Forest Restoration Act § 101:

- (A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or
- (B) in the case of any area for which a community wildfire protection plan is not in effect—
  - (i) an area extending 1/2-mile from the boundary of an at-risk community;
  - (ii) an area within 11/2 miles of the boundary of an at-risk community, including any land that—
    - (I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;

(II) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or

- (III) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and
- (iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

wind-dominated fire a state where the power of the wind is greater than the power of the fire in influencing its behavior.

windthrow a tree or stand of trees that have been blown over by the wind.

winter range the portion of the overall area a species inhabits where the majority of individuals are found from the first heavy snowfall to spring green-up, or during a site-specific period of winter. In the Rocky Mountains, winter range areas tend to have a relatively low amount of snow cover.

yarding the operation of hauling trees from their stump (once cut down) to a collecting point.

**zone 1** an area surrounding the grizzly bear primary conservation area (PCA) in the NCDE, where the intent is to maintain occupancy by grizzly bears, but at expected lower densities than inside the PCA. Zone 1 also includes two demographic connectivity areas. [GBCS]

**zone 2** an area adjacent to the grizzly bear zone 1 and/or zone 3 in the NCDE, where grizzly bears, particularly males, would have the opportunity to move between the NCDE and adjacent ecosystems. The intent of the zone 2 area is to allow for resource management and recreational opportunities while responding to grizzly bear-human conflicts with appropriate management actions.

**zone 3** the area that primarily consists of areas where grizzly bears do not have enough suitable habitat to support population growth. Grizzly bear occupancy will not be actively discouraged in zone 3 and the management emphasis will be on conflict response. [GBCS]

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# **Appendix A: Monitoring Program**

### **Table of Contents**

Overview	1
Adaptive Management	2
Monitoring Scale and Responsibility	
Physical and Biological Ecosystems	5
Human Uses and Designations of the Forest	14
List of Tables	
List of Tables	
Table A-1. Plan monitoring questions and indicators for Terrestrial Ecosystems and Vegetation, an	d Focal
Species	
Table A-2. Plan monitoring questions and indicators for Threatened, Endangered, Proposed and	
Candidate Species	6
Table A-3. Plan monitoring questions and indicators for Non-native Invasive Species	6
Table A-4. Plan monitoring questions and indicators for Soils	6
Table A-5. Plan monitoring questions and indicators for Fire and Fuels Management	6
Table A-6. Plan monitoring questions and indicators for Aquatic Ecosystems	7
Table A-7. Plan monitoring questions and indicators for Wildlife	8
Table A-8. Plan monitoring questions and indicators for Infrastructure (roads and trails)	
Table A-9. Plan monitoring questions and indicators for Recreation	
Table A-10. Plan monitoring questions and indicators for Scenery	15
Table A-11. Plan monitoring questions and indicators for designated Wild and Scenic Rivers	
Table A-12. Plan monitoring questions and indicators for eligible Wild and Scenic Rivers	
Table A-13. Plan monitoring questions and indicators for designated wilderness areas	
Table A-14. Plan monitoring questions and indicators for recommended Wilderness Areas	
Table A-15. Plan monitoring questions and indicators for Timber	
Table A-16. Plan monitoring questions and indicators for Cultural Resources	
Table A-17. Plan monitoring questions and indicators for Social and Economic	18

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### **Overview**

Monitoring provides the feedback for the forest planning cycle by testing assumptions, tracking relevant conditions over time, measuring management effectiveness, and evaluating effects of management practices. Monitoring information should enable the Forest to determine if a change in plan components or other plan management guidance may be needed, forming a basis for continual improvement and adaptive management. Direction for the monitoring and evaluation of forest plans is found under the 2012 planning rule at 36 CFR 219.12 and in the directives at 1909.12 Chapter 30.

The plan monitoring program must contain one or more monitoring questions and associated indicators addressing each of the following:

- 1. The status of select watershed conditions.
- 2. The status of select **ecological conditions** including **key characteristics** of terrestrial and aquatic ecosystems.
- 3. The status of **focal species** to assess the **ecological conditions** required under § 219.9.
- 4. The status of a select set of the **ecological conditions** required under § 219.9 to contribute to the recovery of **federally listed threatened and endangered species**, conserve proposed and **candidate species**, and maintain a viable population of each **species of conservation concern**.
- 5. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
- 6. Measurable changes on the plan area related to **climate change** and other **stressors** that may be affecting the plan area.
- 7. Progress toward **meeting the desired conditions and objectives** in the plan, including for providing **multiple use opportunities**.
- 8. The effects of each management system to determine that they do not substantially and permanently **impair the productivity of the land**.
- 9. Ecosystem services/social and economic (see final directives)

The plan monitoring program addresses the most critical components for informed management of the Forest's resources within the financial and technical capability of the Agency. Every monitoring question links to one or more desired conditions, objectives, standards, or guidelines. However, not every plan component has a corresponding monitoring question.

This monitoring program is not intended to depict all monitoring, inventorying, and data gathering activities undertaken on the Forest; nor is it intended to limit monitoring to just the questions and indicators listed in tables A-1 through A-17. Consideration and coordination with broader-scale monitoring strategies adopted by the regional forester, multi-party monitoring collaboration, and cooperation with State and Private Forestry as well as Research and Development as required by § 219.12(a), will increase efficiencies and help track changing conditions beyond the Forest boundaries to improve the effectiveness of the plan monitoring program. In addition, project and activity monitoring may be used to gather information for the plan monitoring program if it will provide relevant information to inform adaptive management.

The monitoring program sets out the plan monitoring questions, plan components, and associated indicators. The monitoring program will be guided by a monitoring guide (to be developed) that will

provide more detailed information on the monitoring questions, indicator, frequency and reliability, data sources and storage, and cost. For example, we anticipate that forest inventory and analysis data will be used to monitor vegetation conditions and that data will be updated about every 10 years. However, data sources and frequency of updates may change, so the specifics will be included in a monitoring guide. It is important to note that not all monitoring questions are expected to be evaluated biennially.

The Forest used the best available scientific information in the development of the monitoring plan, giving consideration to expected budgets and agency protocols. For example, forest inventory and analysis (FIA) data is the most accurate, reliable, and relevant data source for monitoring terrestrial vegetation conditions because it follows nationwide, statistically based, FIA protocols. Similarly, PACFISH/INFISH biological opinion (PIBO) data is the most accurate, reliable, and relevant data for monitoring aquatic ecosystem conditions because it uses a probabilistic sampling design. The program was initiated to evaluate the effect of land management activities on aquatic and riparian communities at multiple scales and to determine whether management practices are effective in maintaining or improving the structure and function of riparian and aquatic conditions.

An interdisciplinary team will develop a biennial monitoring evaluation report that summarizes the results of completed monitoring, including the evaluation of the collected data and relevant information from broader-scale or other monitoring efforts. The report will also include recommendations for the responsible official as to whether a change to Forest Plan management activities, or the monitoring program, or if a new assessment may be warranted based on the assessed information. The monitoring evaluation report is used to inform adaptive management of the Plan area and will be made available to the public (26 CFR 219.12(d)(2)).

Some types of monitoring indicators require longer time frames for thorough evaluation of results, but a biennial review of the certain information that has been collected ensures timely evaluation to inform planning. The biennial monitoring evaluation does not need to evaluate all questions or indicators on a biennial basis but must focus on new data and results that provide new information regarding management effectiveness, progress towards meeting desired conditions or objectives, changing conditions, or validation (or invalidation) of assumptions.

Tables A-1 through A-17 are organized to display the monitoring question(s), the indicator(s) for answering the monitoring question(s) and the plan components associated with them. Monitoring questions are used to evaluate whether management is maintaining or moving toward or away from desired conditions. Indicators are the specific resource measures used in answering the monitoring questions. In general, the forest plan components listed are the primary direction being addressed by the monitoring question.

### **Adaptive Management**

The revised plan follows adaptive management principles outlined in the planning rule directives (Forest Service Handbook 1909.12, zero code 06.1 and 06.2). Assumptions and uncertainty are characterized throughout the plan and the plan's environmental impact statement. For example, the Forest modelled acres burned by wildfire over the last 1,000 years and interpreted results to assess the natural range of variability for the Forest's ecosystems. We graphed actual acres burned by wildfire in the last hundred years to help validate assumptions, modelled acres that may be burned by wildfire in the future, based upon projections of downscaled climate models, and disclosed the uncertainty of the models. The environmental impact statement used this information to inform the establishment of desired conditions and to assess effects of alternatives on ecological sustainability, considering likely future environments. Once the plan is implemented, monitoring item MON-TE&V-02 would be used to assess wildfire acres

by burn severity class, and monitoring item T&E-LYNX-01 would be used to relate this information to the percentage of lynx habitat burned by wildfire in each lynx analysis unit. This monitoring information would be shared internally and with the public through the monitoring report, so that the Forest can adapt its strategies and adjust decisions based upon what has been learned.

Items included in this monitoring plan also use data collection protocols for terrestrial and aquatic ecosystems at appropriate temporal and spatial scales. For example, monitoring item MON-TE&V-01 would be used to assess the change in key ecosystem characteristics for forest and non-forest vegetation at the scale of the biophysical setting, as well as forestwide. Using adaptive management principals, recently re-measured FIA data informed the development of management direction in the revised plan and will assist the Forest in determining if adjustments to management direction are needed in the future. For example, FIA data was used to assess the trend in the amount of old growth forest, determining the amount burned by wildfire since the last FIA measurements were completed. In light of this monitoring information, the revised plan has added plan components that place more emphasis on management for key ecosystem characteristics of old growth, such as live trees and snags in the 20 inch d.b.h. class. Monitoring item WL-MON-10 would be used to assess the status of habitat for wildlife species associated with snags and live trees in the 20 inch or greater d.b.h class. Monitoring item WL-MON-15 would be used to assess the status of the breeding season bird community on the Flathead National Forest, using Integrated Monitoring in Bird Conservation Regions (IMBCR) data and reports, including species associated with those characteristics.

For aquatic ecosystems, monitoring item MON-WTR-01 would be used to assess water quality, riparian, and aquatic habitats. PIBO monitoring data was used to develop plan components in the revised plan and will be used in the future to test assumptions and assess the trend in key ecosystem characteristics of aquatic ecosystems. For example, metrics such as percent fines, residual pool depth, percent pools, and median substrate size will be collected, along with native fish population monitoring using bull trout redd counts, electrofishing and genetic status monitoring (in cooperation with Montana Fish Wildlife and Parks). This information will enable the Forest to adapt its management strategies and adjust decisions in the future, as needed, based upon what has been learned.

### Monitoring Scale and Responsibility

Monitoring occurs at the scale of the Forest, the Region, and even larger areas. Monitoring may be the responsibility of the Forest Service, another agency, or may involve multiple agencies and organizations. For example, key ecosystem characteristics related to a changing climate may be monitored at very large scales. One key ecosystem characteristic associated with high elevations is "persistent spring snow," which is useful for monitoring habitat for species such as the wolverine. Persistent spring snow maps and data layers were produced by researchers at the scale of the broad range of the wolverine. These maps and data layers would be updated by researchers, not by the individual national forests, and changes would be made only if and when researchers update the existing data. Similarly, a retrospective study of stand composition, structure, and the density of snowshoe hares or habitat use by lynx in response to various past practices would be useful to inform and refine vegetation management techniques in lynx habitat, but would also require a research effort. The presence and distribution of threatened and endangered species, species of conservation concern, and species of public interest are monitored across large scales in cooperation with others or are often assessed as part of a research effort. Montana Fish Wildlife and Parks, Montana Natural Heritage Program, the universities, research stations, non-government organizations, and other federal agencies are all instrumental in monitoring species across multiple land management jurisdictions (e.g., Integrated Bird Monitoring in Bird Conservation Regions).

Monitoring related to the grizzly bear occurs at the large scale of the Northern Continental Divide Ecosystem (NCDE) and is the responsibility of multiple agencies. For example, the USFWS and Montana Fish, Wildlife and Parks are responsible for monitoring grizzly bear-human conflicts, livestock conflicts, and grizzly bear mortality. As directed by the NCDE Grizzly Bear Conservation Strategy (GBCS), monitoring results would be reported to the NCDE Coordinating Committee. The Coordinating Committee is not a decision-making body, although it may provide recommendations to member agencies from time to time. Additionally, the Coordinating Committee does not supersede the authority of the management agencies beyond the specific actions agreed to as signatories to the Conservation Strategy.

As detailed in the monitoring sections of the NCDE GBCS, the following monitoring information would be compiled by the USFS to support the habitat-related tasks of the NCDE Monitoring Team:

- Coordinate updates and maintenance of the motorized access, developed sites, and livestock allotments databases.
- Document and report any changes in motorized access route density, levels of Secure Core habitat, developed sites and their capacity, livestock allotments, and permitted sheep numbers biennially, according to the monitoring schedules described in chapter 3 of the Conservation Strategy.
- Ensure that cooperators have the tools and training to evaluate motorized access route density and secure core habitat for projects.
- Evaluate the need for updating or changing the methods used to evaluate habitat parameters and make recommendations to the NCDE Coordinating Committee on such changes, as necessary.
- Set and maintain standards, definitions, values, formats and processes for collecting and updating habitat data and assessment models consistently across jurisdictions.

In order to accomplish this, a coordinated approach to the funding, use and intensive maintenance of GIS databases are required. The GBCS monitoring team will include biologists and GIS specialists from the signatory agencies (including the USFS) and Tribes.

Because the draft NCDE GBCS describes a need for monitoring to adequately assess habitat conditions, adherence to the habitat standards, and reporting on the habitat monitoring items identified in the Conservation Strategy, some of the monitoring items listed in the table below are part of the USFS Region 1 broad-scale monitoring strategy, but would also be evaluated at the forest scale. The grizzly bear monitoring questions with an "NCDE" prefix, identified in the tables, would apply to the NCDE national forests (Flathead, Lewis and Clark/Helena, Kootenai, and Lolo). The other monitoring items listed in this appendix are intended to be used for forest plan monitoring at smaller scales, but may also be compiled at a regional scale.

Monitoring of ecosystem characteristics may also be applied at the mid-scale or project level. For example, spatial mapping of forest size classes or canopy cover classes may be done, using the Region 1 existing vegetation classification system (Region 1 VMap) or other vegetation data bases, to assess habitat conditions and their distribution for projects. Species-specific habitat models may also be used at the project scale to assess potential effects of forest plan implementation. For example, project-level monitoring can be used to assess availability of multistoried hare habitat within a lynx analysis unit or assess spatial distribution of old growth patch size and connectivity within a sub-watershed.

## **Physical and Biological Ecosystems**

The plan monitoring program contains monitoring questions and indicators addressing the physical and biological elements of the ecosystem, including those associated with vegetation, soils, fish, water, and wildlife (shown in tables A-1 through A-7).

Table A-1. Plan monitoring questions and indicators for Terrestrial Ecosystems and Vegetation, and Focal Species

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-TE&V-01: What is the change in key ecosystem characteristics for forest and nonforest vegetation?	FW-DC-TE&V-03	IND-TE&V- Proportion (percentage of total acres) forestwide and by biophysical setting for each of these indicators:  01. Dominance type (i.e., cover type)  02. Species presence  03. Size class  04. Tree canopy cover.  Very large trees and Snags:  05. Very large tree subclass – proportion of area forestwide and by biosetting  06. Very large tree density, trees per acre. All species combined, and for this species groups: C, DF, L, PP, WP, CW  07. Snag density, snags per acre. For >15 inch d.b.h., >20 inch d.b.h., in/out wilderness/roadless
MON-TE&V-02: Disturbances – Fire. What is the status of fire regimes?	FW-DC-TE&V-03	IND-TE&V-08 Forestwide acres burned by wildfire by severity class (low, medium, high) and acres not burned (since 1980).
MON-TE&V-03: Disturbances – Insects and Disease. What is the change in insect and disease hazard?	FW-DC-TE&V-20	IND-TE&V-09  Acres or percent of Douglas-fir beetle hazard, mountain pine beetle hazard, western spruce budworm hazard, and root disease severity.
MON-TE&V Focal-01: What is the change in ecological conditions within the warm moist and cool moist-mod dry biophysical settings, as indicated by conditions suitable for western white pine?	FW-DC-TE&V-04	IND-TE&V Focal- Proportion (percentage of total acres) forestwide and by the warm moist and cool moist-mod dry biophysical settings for each of these indicators:  01. WP Species presence  02. WP Size class  03. WP tree canopy cover
MON-TE&V Focal-02: What management actions are contributing to the restoration of western white pine?		IND-TE&V Focal-04: Acres treated by various methods for the purpose of sustaining or restoring western white pine.  IND-TE&V Focal-05: Survival of planted western white pine seedlings

Table A-2. Plan monitoring questions and indicators for Threatened, Endangered, Proposed and Candidate Species

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-PLANT-01: What is the status of water howellia in areas where disturbances (natural or human-caused) have occurred?	FW-DC-PLANT-01	IND-PLANT-01: Presence/absence of water howellia in habitat that has been disturbed.
MON-PLANT-02: What is the change in ecological conditions within the cold biophysical setting, as indicated by conditions of whitebark pine?	FW-DC-PLANT-02	IND-PLANT- Proportion (percentage of total acres) forestwide and by biophysical setting for:  02. WBP Dominance type (i.e., cover type)  03. WBP Species presence  04. WBP Size class  05. WBP Tree canopy cover.
MON-PLANT-03: What management actions are contributing to the restoration of whitebark pine?		IND-PLANT-06: Acres treated by various methods for the purpose of sustaining or restoring whitebark pine.  IND-PLANT-07: Survival of planted whitebark pine seedlings
MON-PLANT SCC-01: What is the status of the known occurrences of Plant Species of Conservation Concern (SCC) species?	FW-DC-PLANT SCC- 01	IND-PLANT SCC-01: Occurrences of SCC plants and associated habitats will be monitored.

Table A-3. Plan monitoring questions and indicators for Non-native Invasive Species

<u> </u>		
Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-NNIP-01: What is the status of plant communities at highest risk of negative impacts from established or new invaders to their system functions?	FW-DC-NNIP-01	IND-NNIP-01: Percent of invasive plant species cover within identified high risk/high priority areas These would include such areas as forests on the warm dry biophysical setting, dry grassland plant communities, wilderness trailheads, and management area (MA) 33b special areas.
MON-NNIP-02: What management actions are contributing to coordination and cooperation with adjacent landowners and partners in managing non-native invasive weeds?	FW-DC-P&C-16	<b>IND-NNIP-02</b> : Number and type of weed management actions conducted involving coordination and cooperation with partners and adjacent land owners.

Table A-4. Plan monitoring questions and indicators for Soils

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-SOIL-01: To what extent have vegetation management activities prevented irreversible damage to soil conditions?	FW-DC-SOIL-01 FW-STD-SOIL-01	<b>IND-SOIL-01</b> : Number of harvest units surveyed and percent that meet the soil quality standard, post-harvest.

Table A-5. Plan monitoring questions and indicators for Fire and Fuels Management

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-FIRE-01: What management actions are contributing towards reducing wildland fuels?	FW-DC-FIRE-02	<b>IND-FIRE-01</b> : Acres of hazardous fuel treatments in/out of the wildland-urban interface (WUI).

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-FIRE-02: To what extent is unplanned fire used to achieve desired ecological, social or economic conditions?	FW-DC-FIRE-03	<b>IND-FIRE-02</b> : Number of unplanned natural fire ignitions managed for ecological, social or economic reasons, and the number of unplanned natural ignitions managed with the primary goal of suppression.
MON-FIRE-03: To what extent is planned fire (prescribed fire) used to achieve desired ecological, social or economic conditions?		<b>IND-FIRE-03</b> : Number of planned natural fire ignitions managed for ecological, social or economic reasons.

Table A-6. Plan monitoring questions and indicators for Aquatic Ecosystems

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-WTR-01: What are the changed conditions of instream physical habitat parameters in managed vs unmanaged sites?	FW-DC-WTR-04	<ul> <li>IND-WTR-</li> <li>01. PIBO monitoring: positive trend in PIBO metrics such as bank angle, wood frequency, percent fines, residual pool depth, percent pools, and median substrate size (D50).</li> <li>02. Results of McNeil core samples of percent fines.</li> </ul>
MON-WTR-02: To what extent are forest management activities moving toward habitat objectives for native fish?	FW-OBJ-CNW-01 FW-OBJ-WTR-01 FW-OBJ-WTR-02 FW-OBJ-WTR-03 FW-OBJ-WTR-04	<ul> <li>IND-WTR-</li> <li>03. Number of fish passage barriers removed or created.</li> <li>04. Number of roads decommissioned within the riparian management zone (RMZ).</li> <li>05. Number of culverts removed or upgrades.</li> <li>06. Number of activities with stream miles of habitat improvements.</li> </ul>
MON-WTR-03: What activities have occurred in the RMZ?	FW-STD-RMZ-03 FW-STD-RMZ-04 FW-DC-RHCA-03	<ul><li>IND-WTR-</li><li>07. Treatment type and acres within RHCAs.</li><li>08. Number of entries and road crossing inside of RHCAs.</li></ul>
MON-WTR-04: What is the condition of water quality in water bodies?	FW-DC-WTR-06	IND-WTR-09: Number of water bodies listed on State DEQ integrated report (305b/303d).
MON-WTR-05: What is the status of native fish populations?	FW-DC-CNW-01	<ul> <li>IND-WTR-</li> <li>10. Number of redds (bull trout).</li> <li>11. Fish density – number /100 square meters.</li> <li>12. Degree of spread of hybridization (MFWP data, redd counts).</li> </ul>
MON-WTR-06: Do management activities contribute nutrients to Flathead Lake?	FW-DC-WTR-17	IND-WTR-13: Phosphorus, nitrites, and nitrates.
MON-WTR-07: What is the status of stream banks within grazing allotments?	FW-GDL-05	IND-WTR- 13. Percent streambank alteration 14. Percent utilization on woody veg 15. Percent Utilization on herbaceous veg

	Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
of	ON-WTR-08: What is the status temporary roads and drainage atures?	FW-GDL-IFS-03 FW-GDL-IFS-04 FW-GDL-IFS-05	IND-WTR-16: Number of culverts cleaned and inspected

Table A-7. Plan monitoring questions and indicators for Wildlife

Monitoring Question	Plan Component(s)	Potential Indicator(s)
NCDE-MON-01: Grizzly Bear Habitat Security: What is the baseline open motorized route density (OMRD), total motorized route density (TMRD), and secure core % for each grizzly bear subunit in the primary conservation area (PCA) during the non-denning season?	FW-STD-IFS-02	IND-WLD- For each grizzly bear subunit in the PCA (figure B-01):  01. OMRD.  02. TMRD.  03. Secure core (see GBCS appendix 7 for methods).
NCDE-MON-02: Grizzly Bear Habitat Connectivity: How many miles of roads and motorized trails on National Forest System (NFS) lands are open to public use in the Salish DCA and the rest of zone 1 during the non-denning season?	GA-SM-STD-01	<ul> <li>IND-WLD-</li> <li>04. Miles road in the DCA and the rest of zone 1 (figure B-01) that is open to public motor vehicle use during the non-denning season (mileage as determined through INFRA).</li> <li>05. Miles of trail in the DCA (figure B-01) that is open to public motor vehicle use during the non-denning season (mileage as determined through INFRA).</li> </ul>
NCDE-MON-03: What is the change in the number and capacity of developed recreation sites designed for overnight use in each bear management unit (BMU) in the PCA?	FW-STD-REC-01	<ul> <li>IND-WLD-</li> <li>06. Number of developed recreation sites (NCDE definition) managed for over-night use in the non-denning season in each grizzly BMU (figure 1-32).</li> <li>07. Capacity of sites managed for overnight developed recreation use in the non-denning season in each grizzly BMU (see monitoring guide).</li> </ul>
NCDE-MON-03a: What is the number of day use recreation sites and trailheads in each BMU in the PCA?	FW-DC-REC-01	<b>08</b> Number of trailheads and day use developed recreation sites (NCDE definition) in the non-denning season in each grizzly BMU (see monitoring guide).
NCDE-MON-04: What is the number of active cattle grazing allotments in the PCA and what are their permitted animal unit months?	FW-STD-GR-05	IND-WLD- 09: Number of allotments in the PCA (figure B-01).
NCDE-MON-05: If leasable and locatable mineral activities occur in the PCA, does the Record of Decision and permit/plans of operation include measures to avoid, minimize, or mitigate environmental impacts to grizzly bears or their habitat?	FW-STD-E&M-01 FW-STD-E&M-02 FW-STD-E&M-03 FW-STD-E&M-04 FW-STD-E&M-05 FW-STD-E&M-06	IND-WLD-10: Number of permits authorized in the PCA (figure B-01) and mitigation measures included in the permit/plan of operations.

Monitoring Question	Plan Component(s)	Potential Indicator(s)
NCDE-MON-06: How many subunits in the PCA have temporary increases in motorized access for projects (see glossary)?  NCDE-MON-06a: Are temporary increases in OMRD and TMRD, and temporary decreases in secure core due to projects meeting the standard?	FW-STD-IFS-03	<ul> <li>IND-WLD-</li> <li>For each grizzly bear subunit in the PCA (figure B-01) with projects:</li> <li>11. Percent of grizzly bear subunits with temporary changes in OMRD, TMRD or secure core due to projects.</li> <li>12. Percent change in the 10-year running average of OMRD, TMRD, and secure core for each subunit which had temporary increases in projects (see appendix C for methods).</li> </ul>
NCDE-MON-07: Are projects (see glossary) in the PCA completed within 5-year time period specified by the guideline?	FW-GDL-IFS-01	<ul> <li>IND-WLD-</li> <li>For each grizzly bear subunit in the PCA (figure B-01) with projects (see glossary):</li> <li>13. Number of years to complete each project.</li> <li>14. Number of projects that exceeded 5 years and the reason(s).</li> </ul>
<b>T&amp;E-LYNX-01</b> : What is the percentage of lynx habitat in each lynx analysis unit (LAU) that is not yet hare habitat due to wildfire?	FW-DC-TE&V-19 NRLMD Objective VEG01	IND-WLD-15: Percentage of lynx habitat (figure B-14) on NFS lands in each LAU that is not yet hare habitat due to wildfire (perimeter of stand replacement fires within previous 20 years with unburned area deducted or site specific analysis).
<b>T&amp;E-LYNX-02</b> : What is the percentage of lynx habitat in each LAU that is not yet hare habitat due to regeneration harvest?	NRLMD Standard VEGS1	IND-WLD-16: Percentage of lynx habitat (figure B-14) on NFS lands in each LAU that is not yet hare habitat due to regeneration harvest (regeneration harvest within previous 20 years or site-specific analysis).
<b>T&amp;E-LYNX-03</b> : Is the amount of timber harvest in each LAU meeting the standard?	NRLMD Standard VEGS2	IND-WLD-17: Percentage of lynx habitat (figure B-14) on NFS lands in each LAU with regeneration harvest in the previous decade.
T&E-LYNX-04: Is the amount of precommercial thinning in lynx habitat on NFS lands in each LAU within the limits of incidental take estimated in the Forest Plan Biological Opinion?	NRLMD Standard VEGS5	<ul> <li>IND-WLD-</li> <li>18. Acreage of lynx habitat (figure B-14) on NFS lands in each LAU that were precommercially thinned using exceptions to VEGS5.</li> <li>19. Acreage of lynx habitat (figure B-14) on NFS lands in each LAU that were precommercially thinned using WUI exemptions to VEGS5.</li> </ul>
<b>T&amp;E-LYNX-05</b> : Do modified precommercial thinning techniques in lynx habitat (see appendix C) increase dense horizontal cover and its persistence?	NRLMD Standard VEGS5	<ul> <li>IND-WLD-</li> <li>20. The number of acres of lynx habitat (figure B-14) not treated.</li> <li>21. The number of acres of lynx habitat (figure B-14) treated with modified thinning techniques under exception #3 (if approved).</li> <li>22. The percentage of dense horizontal cover pretreatment and post-treatment, in comparison to untreated plots.</li> </ul>
<b>T&amp;E-LYNX-06</b> : Is the amount of reduction in multistoried hare habitat in lynx habitat on NFS lands in each LAU within the limits of incidental take estimated in the Forest Plan Biological Opinion?	NRLMD Standard VEGS6	<ul> <li>IND-WLD-</li> <li>23. Acres of multistory hare habitat in lynx habitat (figure B-14) on NFS lands in each LAU that were treated using exceptions to VEGS6.</li> <li>24. Acres of multistory hare habitat in lynx habitat (figure B-14) on NFS lands in each LAU that were treated using WUI exemptions to VEGS6.</li> </ul>

Monitoring Question	Plan Component(s)	Potential Indicator(s)
WL-MON-01: What is the status of	FW-DC-WL SCC-01	IND-WLD-
habitat conditions that support harlequin ducks during the nesting season?	FW-GDL-WL SCC-04	<ul><li>25. Stream habitat data on known harlequin duck nesting streams (see aquatics section).</li><li>26. Number of activities authorized in known</li></ul>
		<ul> <li>harlequin duck breeding stream reaches.</li> <li>27. Number of activity authorizations that include timing requirements for harlequin duck nesting.</li> <li>28. Number of harlequin duck broods detected and size of broods.</li> </ul>
WL-MON-02: What is the status of habitat conditions that support flammulated owls during the nesting season?	FW-DC-WL SCC-01 FW-DC-TE&V-09 FW-DC-TE&V-12 FW-DC-TE&V-14 FW-DC-TE&V-16 FW-DC-TE&V-19	<ol> <li>IND-WLD-</li> <li>Percentage of the warm-dry and warm-moist biophysical settings (see figure B-07) with ponderosa pine trees greater than 15 inches d.b.h (dominance type or presence).</li> <li>Average number of snags per acre greater than 15 inches d.b.h. in the warm-dry and warm-moist biophysical settings.</li> <li>Average density of the ponderosa pine dominance type.</li> <li>Number of acres of ponderosa pine forest treated to promote desired landscape pattern for flammulated owls.</li> </ol>
WL-MON-03: What is the status of	FW-DC-TE&V-12	IND-WLD-
habitat conditions that support fisher?	FW-DC-TE&V-13 FW-DC-TE&V-15 FW-DC-TE&V-16 FW-DC-TE&V-17	33. Average number of very large live trees and average number of snags greater than 20 inches d.b.h in the warm-moist biophysical setting (see figure B-07) (excluding the ponderosa pine dominance type).
	FW-DC-TE&V-18 FW-DC-TE&V-19 FW-DC-WL SCC-03 FW-GDL-WL SCC-03	<b>34</b> . Acreage in the warm-moist biophysical setting (see figure B-07)(excluding the ponderosa pine dominance type) with trees greater than 10 inches d.b.h. and canopy cover greater than 40%.
		<b>35.</b> Landscape pattern of forest in the warm-moist biophysical setting (see figure B-07)(excluding the ponderosa pine dominance type) with trees greater than 10 inches d.b.h. and canopy cover greater than 40%.
WL-MON-04: What is the status of	FW-DC-WL SOI-02	IND-WLD-
habitat conditions in RMZs to support wildlife movement and habitat connectivity (include fisher but also other wildlife species)?	FW-DC-WL SOI-03 FW-GDL-WL SOI-05	<b>36</b> . In RMZs (see figure B-06): acres with trees with an average d.b.h. of 5 inches or greater and canopy cover greater than 40%.
but also other whalle species)?		<b>37</b> . In RMZs (see figure B-06): mapped distribution of forest cover with an average tree d.b.h. of 5 inches or greater and canopy cover greater than 40%.
		38. In American Wildlands polygons (see appendix 3): mapped distribution of forest cover with an average tree d.b.h. of 5 inches or greater and canopy cover greater than 40% on NFS lands and all lands.

Monitoring Question	Plan Component(s)	Potential Indicator(s)
WL-MON-05: What is the status of	FW-DC-TE&V-19	IND-WLD-
habitat conditions that support Clark's nutcrackers during the nesting season?	FW-DC-WL SCC-01 FW-GDL-PLANT-03	<b>39</b> . Acreage with presence of live whitebark pine greater than 10 inches d.b.h.
	FW-OBJ-PLANT-01	<b>40</b> . Average basal area of live whitebark pine greater than 10 inches d.b.h.
		<b>41</b> . Acres of modelled whitebark pine habitat with wildfire.
		<b>42</b> . Acreage of vegetation management treatments that contribute to restoration of whitebark pine.
WL-MON-06: What is the status of habitat conditions that support Townsend's big-eared bats and other bat species?	FW-DC-WL-SCC-01	IND-WLD-
	FW-GDL-WL SCC-01 FW-GDL-WL SCC-02	43. Number of structures (old buildings, bridges) and caves surveyed and how many where Townsend's big-eared bats or other bat species were detected.
		<b>44</b> . Number of evaluations for closure or removal of structures used by bats and measures specified to mitigate or provide for bat use.
WL-MON-07: What is the status of	FW-DC-WL SOI-04	IND-WLD-
habitat conditions that support common loons on Code A territorial nesting lakes?	FW-GDL-WL SOI-03 FW-OBJ-WL SOI-01	<b>45</b> . Number of Code A territorial nesting lakes surveyed for loon presence (Hammond 2010).
		<b>46</b> . Number of loon breeding pairs present on Code A territorial nesting lakes during May.
		<b>47</b> . Structures installed to support common loon nesting (if needed).
		<b>48</b> . Number of activities on NFS lands authorized within 150 yards of loon nesting sites and number that included activity timing constraints during the loon nesting season.
WL-MON-08: What is the status of	FW-DC-TE&V-10	IND-WLD-
habitat for wildlife species associated with hardwood tree habitats on NFS lands?	FW-OBJ-TE&V-03	<b>49</b> . Percentage of NFS lands with presence of hardwood trees less than 10 inches d.b.h. (including acres burned by wildfire).
		<b>50</b> . Percentage of NFS lands with presence of hardwood trees greater than 10 inches d.b.h.
		<b>51</b> . Number of acres with vegetation management treatments to promote diverse hardwood forest.
WL-MON-09: What is the status of	FW-DC-TE&V-10	IND-WLD-
habitat for wildlife species associated with grass/forb/shrub habitats on NFS lands?	FW-OBJ-TE&V-04 FW-DC-NNIP-01	<b>52</b> . Percentage of NFS lands in the grass/forb/shrub condition class.
	FW-DC-NNIP-02 FW-DC-NNIP-03	<b>53</b> . Number of acres treated to promote grass/forb/shrub habitats for wildlife.
	FW-OBJ-NNIP-01 FW-GDL-NNIP-01	<b>54</b> . Number of big game winter habitat acres treated to control non-invasive plants.
WL-MON-10: What is the status of	FW-DC-TE&V-16	IND-WLD-
habitat for wildlife species associated with live trees and snags in the 20 inch or greater	FW-DC-TE&V-17	<b>55</b> . Percentage of NFS lands with presence of snags greater than 20 inches d.b.h. in each biophysical setting.
d.b.h class??		56. Average number of snags greater than 20
		<ul><li>inches d.b.h. in each biophysical setting.</li><li>57. Presence of live, decaying, and broken topped trees greater than 20 inches d.b.h.in each biophysical setting.</li></ul>

Monitoring Question	Plan Component(s)	Potential Indicator(s)
WL-MON-11: What is the status of habitat for wildlife species associated with snags in the 10-19.9 inch d.b.h class?	FW-DC-TE&V-16 FW-DC-TE&V-17	<ul> <li>IND-WLD-</li> <li>58. Percentage of NFS lands with presence of snags from 10-19.9 inches d.b.h. in each biophysical setting.</li> <li>59. Average number of snags from 10-19.9 inches d.b.h. in each biophysical setting.</li> <li>60. Presence of decaying and broken topped live trees from 10-19.9 inches d.b.h. in each biophysical setting.</li> </ul>
WL-MON-12: What is the status of habitat for wildlife species associated with large down woody material?	FW-DC-TE&V-18	<b>IND-WLD-61</b> : Average tons per acre of coarse woody material greater than 10 inches diameter in each biophysical setting.
WL-MON-13: What is the status of habitat for wildlife species associated with forests burned with moderate to high severity wildfire?	FW-DC-TE&V-24 FW-GDL-TIMB-02 FW-GDL-TIMB-03 FW-GDL-TIMB-04	<ul> <li>IND-WLD-</li> <li>62. Acreage and distribution of coniferous forests burned with moderate to high severity wildfire.</li> <li>63. Percentage of areas burned with moderate to high severity wildfire with salvage harvest.</li> <li>64. For each wildfire greater than 100 acres, acres of post-fire salvage harvest and acres of burned trees not harvested within fire perimeter.</li> <li>65. For each wildfire greater than 100 acres, size of burned tree patches retained within burn perimeter.</li> <li>66. For each salvage harvest unit in forest that previously met the definition of old growth, number of trees per acre greater than 20 inch d.b.h. retained within salvage harvest units.</li> </ul>
WL-MON-14: What is the status of human disturbance in areas modelled as wolverine maternal denning habitat during the time period from March to mid-May (based upon Copeland and Yates 2006 or subsequent date updates for the northern Rocky Mountains)	FW-GDL-REC-05	IND-WLD-67: Percentage of modelled maternal denning habitat where motorized over-snow vehicle use is allowed during the March to mid-May time period.
WL-MON-15: What is the status of the breeding season bird community on the Flathead National Forest (including neo- tropical migratory birds)?	FW-DC-WL SOI-01	<ul> <li>IND-WLD-</li> <li>68. Number of bird species detected on the Flathead National Forest.</li> <li>69. Number and names of species detected previously but no longer detected.</li> <li>70. Number and names of species not detected previously but now detected.</li> <li>71. Statistically significant trends in bird data on the Flathead National Forest.</li> </ul>

Monitoring Question	Plan Component(s)	Potential Indicator(s)
WL-MON-16: What is the status of the aquatic amphibian and reptile community on the Flathead NF?	FW-DC-WTR-01 FW-DC-WTR-03 FW-DC-WTR-12 FW-DC-WTR-16 FW-DC-WTR-19 FW-DC-NNIP-01 FW-DC-NNIP-02 FW-DC-NNIP-03 FW-OBJ-NNIP-01	<ul> <li>IND-WLD-</li> <li>72. Number of aquatic sites monitored.</li> <li>73. Number of sites where boreal toad reproduction detected.</li> <li>74. Number of sites where aquatic invasive species detected.</li> </ul>

## **Human Uses and Designations of the Forest**

The plan monitoring program contains monitoring questions and indicators addressing human uses of the forest associated with the transportation system, recreation, scenery, timber production, and other socioeconomic factors (tables A-8 through A-10; tables A-15 through A-17). Monitoring items associated with designated areas, such as recommended wilderness and wild and scenic rivers, are also identified (tables A-11 through A-14).

Table A-8. Plan monitoring questions and indicators for Infrastructure (roads and trails)

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-IFS-01: Are road restrictions effective?	FW-DC-IFS-11	<b>IND-IFS-01:</b> Number of road closure devices determined to be ineffective at restricting motorized use.
MON-IFS-02: What are the trends in the transportation system?	FW-DC-IFS-04	<ul> <li>IND-IFS-</li> <li>02. Miles of road open year-long.</li> <li>03. Miles of road open seasonally.</li> <li>04. Miles of roads maintained by maintenance level.</li> <li>05. Miles of roads decommissioned.</li> <li>06. Miles of roads put into intermittent storage.</li> </ul>
MON-IFS-03: Have management activities trended towards desired conditions for a transportation system that provides recreation opportunities, safe and efficient public and agency access, and are environmentally compatible?	FS-DC-IFS-06	<ul> <li>IND-IFS-</li> <li>07. Acres open to over-snow vehicle use</li> <li>08. Miles of groomed over-snow vehicle trails</li> <li>09. Number and miles of motorized and non-motorized loop trail.</li> </ul>
MON-IFS-04: Is the existing trail system sustainable to meet the current demand?	FW-DC-IFS-09	<ul><li>INDS-IFS</li><li>10. Amount of miles maintained to standards.</li><li>11. Amount of miles improved to standards.</li></ul>

Table A-9. Plan monitoring questions and indicators for Recreation

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-REC-01: What is the status of visitor use, and visitor satisfaction?  MON-REC-02: Does the forest provide sufficient and sustainable recreation opportunities?	FW-DC-REC-11	<ul> <li>IND-REC-</li> <li>Using the National Visitor Use Monitoring data, show trends for:</li> <li>01. Visitation estimates.</li> <li>02. Visitor activities.</li> <li>03. Percent overall satisfaction.</li> </ul>
MON-REC-03: What is the progress towards meeting recreation objectives in the plan?	FW-OBJ-REC 01 FW-OBJ-REC-03 FW-OBJ-REC-04 GA-NF-OBJ-02 GA-SV-OBJ-01 GA-SM-OBJ-02 GA-SM-OBJ-03 GA-SM-OBJ-04	<ul> <li>IND-REC-</li> <li>04. Number of dispersed recreation sites on the forest that have been rehabilitated to correct erosion or sanitation issues.</li> <li>05. Number of campgrounds that have been improved.</li> <li>06. Number of recreation cabin rentals added to the national reservation system since the record of decision.</li> <li>07. Number of bicycle trails constructed in the Whitefish Range vicinity.</li> <li>08. Construction of a bike trail in the Crane Mountain area.</li> </ul>

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
		<b>09.</b> Construction of a non-motorized trial that connects NFS lands in the Blacktail vicinity to the Foy's to Blacktail Trail system.
		<b>10.</b> Construction and designation of a motorized trail connectors that provide high elevation loop opportunities.
		11. Construction of a non-motorized trail that connects the Whitefish Trails (WhitefishLegacy.org) to NFS lands.
MON-REC-04: Are management actions moving the existing summer and winter recreation opportunity spectrum classes towards the desired summer and winter recreation opportunity spectrum classes?	FW-DC-SREC-01 FW-DC-WREC-01 FW-DC-REC-02	IND-REC-12: Describe amount of existing recreation opportunity spectrum classes compared to the desired recreation opportunity spectrum classes by season (winter and summer) across the forest.

Table A-10. Plan monitoring questions and indicators for Scenery

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-SCN-01: Are management actions moving towards desired scenic integrity objectives identified in the plan?	FW-DC-SCN-02	<b>IND-SCN-01:</b> Describe the amount of existing scenic integrity objectives compared to desired scenic integrity objectives.

Table A-11. Plan monitoring questions and indicators for designated Wild and Scenic Rivers

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-WSR-01: Is the free-flowing character of the three forks of the Flathead Wild and Scenic river maintained?	MA2a-DC-01 MA2a-DC-02	IND-WSR- 01. Number of monitoring items per the limits of acceptable change direction in the Wild and Scenic River Recreation Direction that are in compliance.
MON-WSR-02: Are the outstandingly remarkable values for which the three forks of the Flathead Wild and Scenic River		<b>02.</b> Number of monitoring items per the limits of acceptable change direction in the Wild and Scenic River Recreation Direction that are <u>not</u> in compliance.
was designated preserved and enhanced?		<b>03.</b> Number and type of actions that changed free-flowing character, water quality or affected the outstandingly remarkable values on the three forks of the Flathead River.

Table A-12. Plan monitoring questions and indicators for eligible Wild and Scenic Rivers

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-EWSR-01: Is the free-flowing character of eligible wild and scenic rivers maintained?	MA2b-DC-01 MA2b-DC-02	<ul><li>IND-WSR-</li><li>04. Number and type of actions that changed free-flowing character or affected the outstandingly remarkable values of eligible rivers.</li></ul>
MON-EWSR-02: Are the outstandingly remarkable values for which the river was deemed eligible, preserved and enhanced?		

Table A-13. Plan monitoring questions and indicators for designated wilderness areas

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-WILD-01: Do management activities in designated wilderness areas protect and maintain preserve wilderness character?	FW-MA1a-DC-01	<ul> <li>IND-WILD-</li> <li>01. The National Wilderness Stewardship Performance monitoring measures.</li> <li>02. Limits of acceptable change monitoring measures for the Bob Marshall Wilderness Complex and Mission Mountains Wilderness.</li> <li>03. The number and type of authorized motorized travel and use and mechanized transport entry as reported through INFRA.</li> <li>04. The number and type of unauthorized motorized travel and use, and travel and uses and mechanized transport.</li> </ul>
MON-WILD-02: Are natural process and disturbance the primary forces affecting the composition, structure, and pattern of vegetation?	FW-MA1a-DC-03	IND-WILD-04: Number, kind, and extent of vegetation disturbances (natural and human-caused) that have occurred in designated wilderness areas on the forest.

Table A-14. Plan monitoring questions and indicators for recommended Wilderness Areas

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-RWILD-01: Do restoration activities outcomes protect the wilderness characteristics of the recommended wilderness area?  MON-RWILD-02: Are restoration	MA-1b-DC-02 MA1b-SUIT-06	IND-RWILD- 01. Number, kind, and extent of restoration treatment (including prescribed fire) that has occurred in recommended wilderness area.
activities within recommended wilderness maintaining and protecting the ecological and social characteristics that provide the basis for suitability into the National Wilderness Preservation system?		
MON-RWILD-03: Alternative B	MA1b-SUIT-01	IND-RWILD-
only: Has use levels of mechanical transport and motorized over-snow vehicle use increased over baseline use levels (Record of Decision)?		<b>02.</b> Determine if mechanized transport use levels trails on trails in recommended wilderness areas that allow mechanized transport is above existing baseline levels by the use of trail counters, ocular estimates, and site visitation.
MON-RWILD-04: Alternative B only: Are existing motorized oversnow vehicle use and existing mechanized transport preventing the protection of the social and ecological characteristics that provided the basis for each areas suitability into the National Wilderness preservation System?		<b>03.</b> Determine if motorized over-snow vehicle use in the Fatty Creek Recommended Wilderness Area is above baseline levels by the use of ocular estimates and site visitation.
MON-RWILD-05: Have commercial	MA1b-SUIT-04	IND-RWILD-
or non-commercial use of non- timber forest products (e.g., mushrooms, huckleberries) within the recommended wilderness		<b>04.</b> Number, kind, and extent of commercial or non-commercial use of non-timber forest products (e.g., mushrooms, huckleberries)
areas protected or maintained the		

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
ecological and social characteristics that provided the basis for each areas suitability into the National Wilderness preservation System?		

Table A-15. Plan monitoring questions and indicators for Timber

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-TIMB-01: How are management actions contributing to a sustainable mix of forest products in response to market demands?	FW-DC-TIMB-01 FW-DC-TIMB-03	IND-TIMB-01: Million board feet (MMBF)/ million cubic feet (MMCF) offered and sold annually.
MON-TIMB-02: How are management actions contributing towards the recovery of economic value of dead/dying trees on suitable lands?	FW-DC-TIMB-02	IND-TIMB-02: Million board feet (MMBF) / million cubic feet (MMCF) offered and sold annually as salvage harvest.

Table A-16. Plan monitoring questions and indicators for Cultural Resources

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-C&HR-01: To what extent cultural and historic resource objectives being met with trending towards desired conditions to identify, evaluate, and nominate cultural resources for listing on the National Register of Historic Places?	FW-OBJ-C&HR-01 FW-OBJ-C&HR-02 FW-OBJ-C&HR-03	<ul> <li>IND-C&amp;HR-</li> <li>01. Number of submitted cultural resource nominations to the State Historic Preservation Officer or number of the completed historic contexts, overviews, thematic studies, or cultural resources property preservation plans for significant cultural resources identified through the inventory that are not National Register-eligible.</li> <li>02. Number of completed public outreaches or interpretive projects.</li> </ul>
MON-C&HR-02: To what extent is the Forest meeting Forest Plan desired conditions to assuring treaty rights are preserved and trending toward desired conditions for consultation with each Tribe?	FW-DC-C&HR-02 FW-OBJ-TRIB-01 FW-OBJ-TRIB-02	<ul> <li>IND-C&amp;HR-</li> <li>03. Number of completed consultations under the consultation protocol.</li> <li>04. Completion of a cooperatively established tribal consultation protocol.</li> </ul>

Table A-17. Plan monitoring questions and indicators for Social and Economic

Monitoring Question(s)	Plan Component(s)	Potential Indicator(s)
MON-S&E-01: To what extent is forest providing goods and services for local communities?  MON-S&E-02: To what extent is forest contributing towards desired conditions for a stable and functioning local economy?	FW-DC-S&E-02	IND-S&E-01: Levels of production of multiple uses including timber products, grazing, recreational visits, wilderness hunting and fishing opportunities, and downhill skiing (as measured through day visits, night visits, local and non-local, animal unit months, thousand cubic feet from harvest and sales).  IND-S&E-02: Number of jobs and thousands of dollars in labor income from Flathead National Forest management.  IND-S&E-03: Land payment revenues (e.g., Secure Rural Schools Act, payment in lieu of taxes, etc.) to state and counties from Flathead NFS lands.
MON-S&E-03: To what extent do opportunities to connect people, including youth, with nature exist across the Forest?	FW-DC-S&E-03 FW-DC-R&E-01 FW-DC-R&E-02 FW-DC-R&E-03 FW-DC-R&E-04	IND-S&E-03: Number and type of education and youth programs  NVUM report IND-REC-X  visitor center tracking  IND-S&E-04: Number of youth participating in various forest education and youth programs, including employment.
MON-S&E-04: Is the cost of implementing the Forest Plan consistent with that predicted in the FEIS?	Not component specific	<b>IND-S&amp;E-02-01:</b> Forest annual budget, supplemented with partnerships and other outside funding.

## **Appendix B: Maps**

**NOTE:** All of the figures are located on the map cd that accompanies the DEIS, expect figure B-01, which is printed on the following page.

## List of Figures

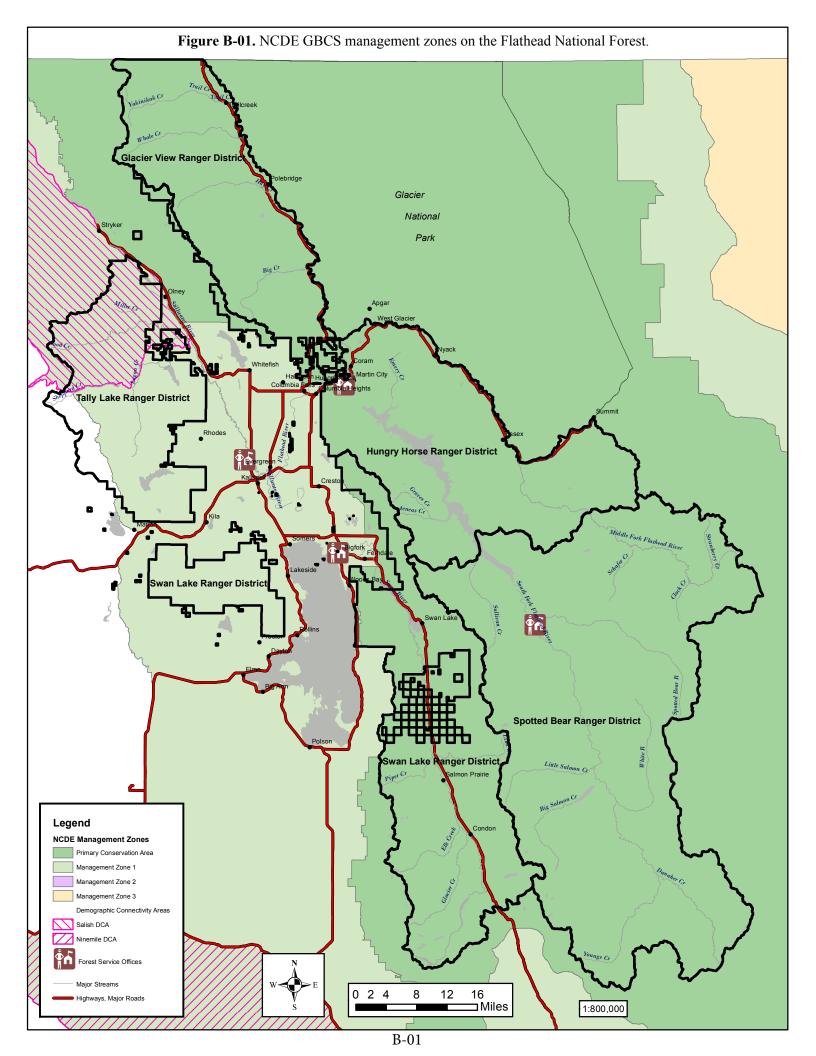
NCDE GBCS management zones on the Flathead	B-01
Inventoried roadless areas on the Forest	B-02
Over-snow suitability by alternatives B, C, and D	B-03–05
Watershed Conservation Framework Class 2 watersheds	B-06
Conservation Watershed Network	B-07
Westslope Cutthroat Genetic Purity	B-08
Riparian management zones	B-09
Biophysical setting forestwide	B-10
Biophysical settings by geographic area	B-11–16
Lynx Habitat	B-17
Wildland Urban Interface	B-18
Desired Summer ROS settings (alts B, C, D)	B-19–21
Desired Winter ROS settings (alts B, C, D)	B-22–24
Scenic integrity objectives (alts B, C, D)	B-25–27
National trails	B-28
PNW Scenic Trial Corridor	B-29
Continental Scenic Divide Trail Corridor	B-30
White-tail deer habitat	B-31
Management areas by GA (alt B 32-37, alt C 38-43, alt D 44-49)	B-32–49
Special Areas	B-50–52
North Fork Federal Lands Withdrawal Area	B-53
Selected American Wildlands polygons for connectivity analysis	B-54
Suitability GA-NF-MA7 (Crystal-Cedar and Werner-Nicola are alt D only)	B-55
MA7 Big Mountain summer ROS and Winter ROS	B-56–57
Bull trout occupancy climate shield	B-58
Cutthroat trout occupancy climate shield	B-59

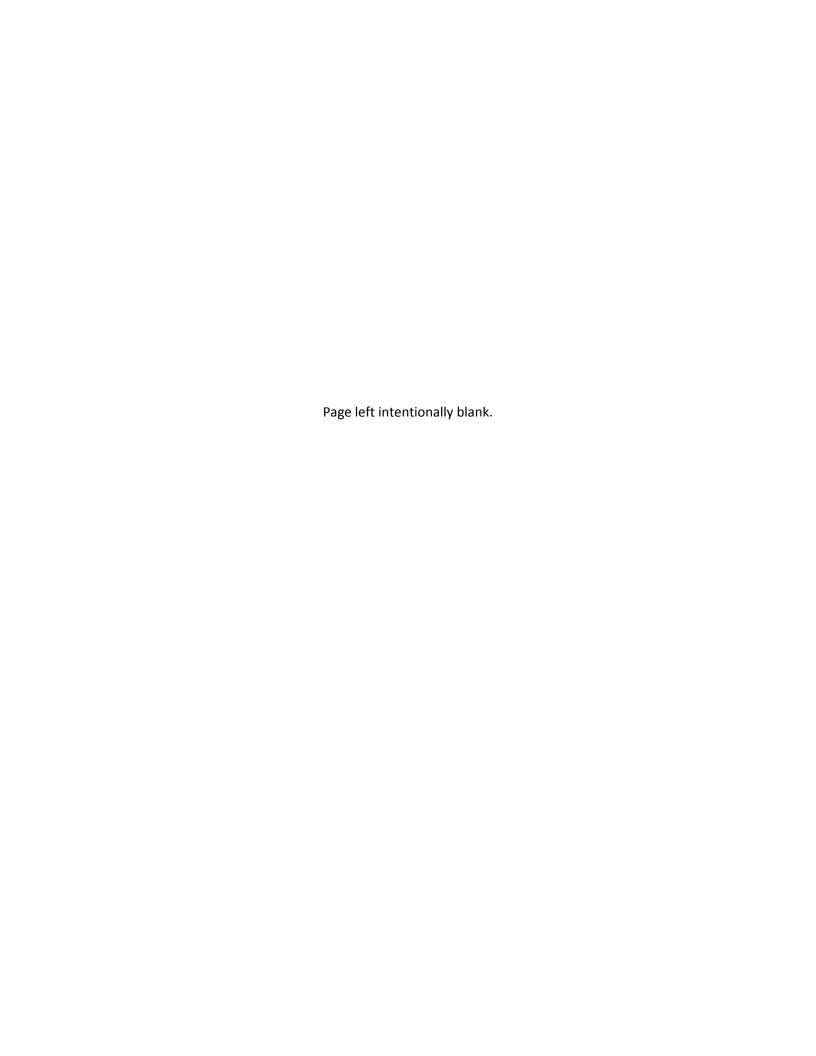
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B-i Appendix B: Maps

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B-ii Appendix B: Maps





# **Appendix C: Potential Management Approaches and Possible Actions**

## **Table of Contents**

Introduction	C-1
Possible Forest Management Actions and Timber Harvest Levels	C-2
Possible Management Strategies and Approaches	C-5
Watershed and Aquatic Species	C-5
Bull trout and bull trout critical habitat	C-5
Flathead Geographic Region / Flathead Lake Core Area (Complex)	C-6
Multi-scale analysis	
Stormproofing prioritized Conservation Watershed Networks	C-9
Riparian management zones	C-11
Threatened species, endangered species, wildlife species of conservation concern (SCC)	
associated with aquatic or riparian habitats	C-12
Black swift (SCC)	C-12
Harlequin duck (SCC)	C-12
Other wildlife associated with aquatic habitats, wetlands, and riparian management zones	C-13
Bald eagle nests and screening vegetation	
Great blue heron nesting rookeries	
Common loon nesting territories	C-15
Veery	
Wildlife habitat connectivity in riparian management zones	C-16
Terrestrial Vegetation	
Desired conditions — general information	C-16
Objectives — possible actions and strategies	C-17
Management areas	C-18
General Forest MAs 6a, 6b, 6c	
Focused Recreation MA 7	
MAs that are designated unsuitable for timber production	
Coniferous forest types	
General strategies	
Strategies specific to biophysical setting	
Live tree retention within regeneration harvest units	
Old growth forests and old growth habitat	
Desired condition FW-DC-TE&V-15 – old growth forest	C-24
Desired conditions FW-DC-TE&V-11, 12, 13 – forest size classes and very large tree	
subgroup	
Guideline FW-GDL-TE&V-07	
Snags and downed wood	
Desired condition FW-DC-TE&V-16, 17, 18 – key points	
Standards and guidelines (FW-STD-TE&V-05, 10)	
Forest pattern, patch sizes	C-27

	opinication of the standard specifying maximum opening size for timber harvest (1 w-51	
	MB-07)	
	tential strategies	
	anaging forest pattern to provide wildlife habitat connectivity	
	ed forests	
	coniferous plant communities	C-32
	ned species, endangered species, and species of conservation concern associated with	~ ~ ~
	strial habitats	
	S	
	ater howellia	
	hitebark pine	
	ife	
	ınada lynx habitat and/or critical habitat	
	rizzly bear habitat	
	sher (SCC)	
	ammulated owl (SCC)	
	ark's nutcracker (SCC)	
	ssible strategies for the Townsend's big-eared bat and other bat species	
	llife species	
	tive invasive plants	
	nagement and air quality	
	gement approaches for unplanned ignitions	
Mana	gement approaches for prescribed fires (planned ignitions)	C-46
Recreati	ion	C-46
Wildern	ess	C-47
Other sp	pecial designations	C-47
Resea	rch natural areas (MA 4a)	C-47
Speci	al areas (MA 3b)	C-48
Corar	n Experimental Forest (MA 4b)	C-49
Infrastru	acture	C-49
Lands		C-50
Special	forest products	C-50
Mineral	S	C-50
Livesto	ck grazing	C-51
Cultural	resources and areas of tribal importance	C-51
	vation education	
	List of Tables	
Table C-1.	Vegetation management practices for timber harvest, annual average acres for the first second decades of the plan period	
Table C-2.	Projected timber sale program, annual average volume outputs for the first and second of the plan period	decades
Table C-3	Conservation Watershed Network high priority sub-watersheds	C-10
	Food plants used by snowshoe hares in the Western Rockies, Cascades and Intermount	tain
T 11 C 7	West (source: table 2.1 Lynx Biology Team 2013)	
Table C-5.	Changes in values in a bear management subunit for open motorized route density, total motorized route density, and secure core for project in years 7 through 10	

	Changes in values in a bear management subunit for open motorized route density, total motorized route density, and secure core for project in years 5 through 10
Table C-7.	Unfilled research natural area target recommendations for the forest and woodland class and priority ranking for assessments for the Flathead National Forest
Table C-8.	Unfilled research natural area target recommendations for the shrubland and herbaceous class and priority ranking for assessments for the Flathead National Forest
	List of Figures
Figure C-1	. Example of habitat connectivity analysis
Figure C-2	. Diagram of Bull's patch thinning technique
Figure C-3	. Traditional thinning 20 years after harvest – 30 years later. All trees thinned to an average of
	300 trees per acre–dense understory providing hare habitat lacking
Figure C-4	. Same forest stand as shown in the previous figure with modified precommercial
	thinning: C-20 years after harvest – 30 years later. Western larch and Douglas fir canopy
	thinned to an average of 300 trees per acre, but smaller spruce and fir in the understory not
	thinned –dense understory providing hare habitat present

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#### Introduction

This appendix describes the possible actions and potential management approaches and strategies the Flathead National Forest may undertake to make progress in achieving the desired conditions described in the plan. It is also intended to clarify how the planned outcomes (i.e., objectives, desired conditions) in the plan may be achieved.

The 2012 planning rule requires land management plans to "...contain information reflecting proposed and possible actions that may occur on the plan area during the life of the plan, including: the planned timber sale program; timber harvesting levels; and the proportion of probable methods of forest vegetation management practices expected to be used (16 United State Code (U.S.C.) 1604(e)(2) and (f)(2)). Such information is not a commitment to take any action and is not a 'proposal' as defined by the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (40 CFR 1508.23, 42 U.S.C. 4322(2)(C)). (36 CFR 219.7(f)(1))." Management approaches and strategies presented in this section may include suggestions for on-the-ground implementation, analysis, assessment, inventory or monitoring, and partnership and coordination opportunities the forest is proposing as helpful to make progress in achieving its desired conditions. The potential approaches and strategies are not intended to be all-inclusive, nor commitments to perform particular actions.

The Revised Flathead National Forest Plan employs a strategy of adaptive management in its decision making and achievement of Forest Plan desired conditions and objectives. An adaptive management strategy emphasizes the learning process. It involves using the best current knowledge to design and implement management actions, then monitoring and evaluating results and adjusting future actions on the basis of what has been learned. This is a reasonable and proactive approach to decision making considering the degree of uncertainty in future ecological, social and economic factors.

This appendix provides information intended to clarify the intent and provide suggested means to achieve specific forest plan direction and components for individual resource areas. This approach recognizes the highly variable site conditions and management situations that can occur across the Forest that are most appropriately addressed at the level of project analysis.

This appendix includes a list of possible project types that may be undertaken to move toward the desired conditions and objectives. The types of actions that are exemplified do not commit the Flathead National Forest to perform or permit these actions, but are provided as actions that would likely be consistent with plan components, particularly the desired conditions and objectives. Information included does not direct or compel processes such as analysis, assessment, consultation, planning, inventory, or monitoring.

These possible actions includes the possible timber sale program, timber-harvesting levels, and the proportion of probable methods of forest vegetation management practices expected to be used over the life of the plan. However, speculation about the specific amount or treatment types, frequency, location, magnitude, or numbers of actions during the plan period are not included. This appendix does not serve as a "to do" list of projects and expected dates in the plan. The potential management approaches included may be used to inform future proposed and possible actions. Additionally, a plan may also include optional content, such as strategies and partnership opportunities or coordination activities.

# Possible Forest Management Actions and Timber Harvest Levels

As required by the 2012 planning rule, this section identifies the possible actions and proportion of probable methods of forest vegetation management practices expected to be used to achieve desired timber harvesting levels and outputs. The identification of possible actions includes an estimate of timber harvesting levels anticipated over the next 1 to 2 decades, but does not include speculation about the specific amount, frequency, location, magnitude, or numbers of actions during the plan period.

Estimated acres of treatment and associated timber product outputs (reported in million cubic feet (mmcf) and million board feet (mmbf)) were determined through use of the SPECTRUM model. This model is an analytical tool used to evaluate vegetation management scenarios that achieve resource objectives. Among other things, the model provides an estimate of the level of timber products expected and the management practices applied to achieve that level, given a set of inputs that includes existing and desired vegetation conditions, budget and resource constraints, and expected vegetation change pathways.

Table C-1 displays the acres and probable treatments expected for each action alternative for the first and second decades of the plan period. Production of sawtimber and other wood products is expected through commercial timber harvest activities, which includes even-aged regeneration harvests (e.g., clearcut, seedtree, shelterwood) and other non-regeneration harvests (for modeling purposes, these are mostly commercial thinning, with lesser amounts of group selection harvests). The appropriate or optimum methods of harvest would be based upon site-specific determinations, as evaluated and determined during project planning and documented in a silvicultural prescription.

Table C-1. Vegetation management practices for timber harvest, annual average acres for the first and second decades of the plan period

Type and Decade of Harvest	Alternative B	Alternative C	Alternative D
Even-aged Regen (decade 1)	1,845	77	1,833
Even-aged Regen (decade 2)	1,942	411	908
Non-Regen (decade 1)	1,000	2,500	-
Non-Regen (decade 2)	860	2,827	1,500
Total (decade 1)	2,845	2,577	1,833
Total (decade 2)	2,802	3,238	2,408

Table C-2 displays the projected timber sale quantity (for products meeting utilization standards) and the projected wood sale quantity (for products such as fuelwood or biomass that does not meet timber product utilization standards) for lands suitable and not suitable for timber production.

As required by the 2012 planning rule, the estimates in table C-2 take into account the fiscal capability of the planning unit and are consistent with all plan components. They are based on Flathead National Forest's average budget levels over the past 3 years. However, the estimates of timber outputs may be larger or smaller on an annual basis, or over the life of the plan, if budget or other constraining factors change in the future. The maximum quantity of timber that may be sold is limited to the sustained yield limit of 25.4 mmcf.

Table C-2. Projected timber sale program, annual average volume outputs for the first and second decades of the plan period

Category and Decade	Alt. B (mmcf)	Alt. B (mmbf)	Alt. C (mmcf)	Alt. C (mmbf)	Alt. D (mmcf)	Alt. D (mmbf)
Timber Products <sup>a</sup> A1. Lands suitable for timber production (decade 1)	5.2	25.8	3	13.8	5.8	28.6
Timber Products <sup>a</sup> A1. Lands suitable for timber production (decade 2)	5.2	24.5	3.7	17.6	5.7	27.6
Timber Products <sup>a</sup> A2. Lands not suitable for timber production (decade 1)	0.3	1.6	0.9	4.2	0.1	0.6
Timber Products <sup>a</sup> A2. Lands not suitable for timber production (decade 2)	0.3	2.7	0.9	4.4	0.2	1
Projected Timber Sale Quantity (PTSQ, A1 + A2) (decade 1)	5.5	27.4	3.9	18	5.9	29.2
PTSQ (A1 + A2) (decade 2)	5.5	27.2	4.6	22	5.9	28.6
Other Wood Products <sup>b</sup> B. All lands (decade 1)	0.8	n/a <sup>c</sup>	0.6	n/a <sup>c</sup>	0.9	n/a <sup>c</sup>
Other Wood Products <sup>b</sup> B. All lands (decade 2)	0.8	n/a <sup>c</sup>	0.6	n/a <sup>c</sup>	0.9	n/a <sup>c</sup>

Category and Decade	Alt. B (mmcf)	Alt. B (mmbf)	Alt. C (mmcf)	Alt. C (mmbf)	Alt. D (mmcf)	Alt. D (mmbf)
Projected Wood Sale Quantity (PWSQ) – Timber Products <sup>a</sup> and Other Wood Products <sup>b</sup> (A1 + A2 + B) (decade 1)	6.3	n/a <sup>c</sup>	4.5	n/a <sup>c</sup>	6.8	n/a <sup>c</sup>
PWSQ – Timber Products <sup>a</sup> and Other Wood Products <sup>b</sup> (A1 + A2 + B) (decade 2)	6.3	n/a <sup>c</sup>	5.2	n/a <sup>c</sup>	6.8	n/a <sup>c</sup>

a. Timber Products - Volumes other than salvage or sanitation volumes that meet timber product utilization standards.

Source: SPECTRUM model analysis

b. Other Wood Products - Fuelwood, biomass, and other volumes that do not meet timber product utilization standards (small diameter 3 -7 inches).

c. n/a - not applicable

## **Possible Management Strategies and Approaches**

## **Watershed and Aquatic Species**

Watersheds, habitats, and aquatic species exist within a larger, interconnected hydrological system, which often extends beyond forest management boundaries such as Flathead Lake or even to Canada.

The Flathead National Forest's plan components for aquatic ecosystem diversity and species diversity involve a two-tiered approach. First, in a coarse-filter approach, aquatic ecosystems are managed toward reference conditions, which are approximated by conditions found in watersheds that have experienced minimal human disturbances. The assumption is that managing toward reference conditions would provide the majority of necessary habitat conditions to support the native aquatic species that have evolved here. Due to societal and ecological changes, the Flathead National Forest cannot be managed to exactly mimic reference conditions, but managing aquatic ecosystems within this context would provide suitable aquatic habitats for native species. A primary mechanism of the coarse filter is the designation of riparian management zones (RMZs). These are areas along streams, lakes, ponds, and other wetland areas that have specific protections in the form of standards and guidelines. Desired conditions for watersheds and RMZs as well as plan components are based upon best available science or previously overlooked components from our 1986 plan as amended. In addition, best management practices, including "Montana Best Management Practices" and "R1 Soil and Water Conservation Practices" are implemented to protect or restore water quality under the Clean Water Act. These practices are also considered a key element of the coarse filter.

Second, species are evaluated to determine limiting habitats, population influences, and whether they have special habitat needs that may not be provided through coarse filter plan components. Fine filter plan components are listed for species in one of the following categories: threatened and endangered species (bull trout) and species of conservation concern (westslope cutthroat trout). Species may need additional species-specific plan components as specified in conservation strategies for individual species or groups of species. Bull trout is currently listed as a threatened species under the Endangered Species Act. Through the plan components, including desired conditions, objectives, standards and guidelines, this species would be anticipated to trend toward recovery and subsequent delisting.

#### Bull trout and bull trout critical habitat

The desired condition to work cooperatively to recover bull trout sets the stage for management.

FW-DC-P&C: 15 Bull trout population trends toward recovery through cooperation and coordination with USFWS, tribes, state agencies, other federal agencies, and interested groups. Recovery is supported through the Bull Trout Conservation Strategy and the Bull Trout Recovery Plan.

There is direction within the *U.S. Forest Service Bull Trout Conservation Strategy*<sup>1</sup> that would move the current baseline condition to an upward trend for each local bull trout population for indicators (temperature, barriers, pools, and sediment). There are restoration activities such as barrier removal, road decommissioning etc. that are listed for each local population. The *Recovery Plan for the Coterminous United States Population of Bull Trout (Salvelinus confluentus)* (also known as the Bull Trout Recovery

<sup>&</sup>lt;sup>1</sup> USFS. 2013. U.S. Forest Service Bull Trout Conservation Strategy. Missoula, Montana.

Plan<sup>2</sup>) has recovery goals, objective and criteria that the Forest would cooperate with partners to achieve. By doing this, threats can be managed and a sufficient distribution and abundance of bull trout would be ensured across the forest. The *Columbia Headwaters Recovery Unit Implementation Plan for bull trout (Salvelinus confluentus)* (also known as the Recovery Unit Implementation Plan<sup>3</sup>) is a subset of the recovery plan that identifies threats and actions within each core area.

#### Flathead Geographic Region / Flathead Lake Core Area (Complex)

As an example, for the Flathead Lake Core area, which includes the Middle and North Fork of the Flathead rivers, the Recovery Unit Implementation Plan<sup>4</sup> proposes to address habitat threats and water quality through the following actions:

#### 1. Actions to Address Habitat Threats

#### 1.1. Upland/Riparian Land Management

1.1.1. Conserve existing habitat and support passive restoration. Long-term habitat protection is in place for much of the Middle Fork and North Fork headwaters (Bob Marshall and Great Bear Wilderness and Glacier National Park) which comprise the largest interconnected network of cold water SR habitat in the recovery unit. Passive restoration should continue in order to consolidate habitat gains in the managed portions (west side) of the North Fork and its British Columbia headwaters.

#### 1.2. Instream Impacts

- 1.2.1. Improve productivity and stability of the Flathead Lake fish community by restoring habitat quality. Improve tributary passage and minimize nonnative species (i.e., brook trout) in potential tributary SR habitat.
- 1.2.2. USBOR [U.S. Bureau of Reclamation] will follow VARQ (variable discharge) flood control procedures at Hungry Horse to balance refill with downstream flow. Maintain minimum flows all year for bull trout with a sliding scale based on the forecast. Operate to meet minimum flows of 3200 to 3500 cubic feet per second (cfs) at Columbia Falls on the mainstem Flathead River and 400 to 900 cfs in the South Fork Flathead River (downstream of dam). Provide even or gradually-declining flows during summer months (minimize double peak). Limit outflow fluctuations by operating to ramping rates set in the 2000 Service Biological Opinion to avoid stranding bull trout.

#### 1.3. Water Quality

1.3.1. USBOR will limit spill at Hungry Horse to maximum of 15 percent of outflow to avoid exceeding Montana State total dissolved gas standards of 110 percent.

1.3.2. Supply cold water. The primary prescription to address climate change in the Flathead Core Area is to continue to strengthen connectivity and consolidate habitat gains in

<sup>&</sup>lt;sup>2</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). U.S. Fish and Wildlife Service, Pacific Region. Portland, Oregon. 179 pp.

<sup>&</sup>lt;sup>3</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>4</sup> Ibid.

headwater SR tributaries while seeking to secure sources of cold water in the SR tributaries.

In this example, the forest would address the threats that have been identified by continuing restoration efforts in the North Fork such as road decommissioning and culvert upgrade and continue to provide cold water through riparian management and hydrologically disconnecting road networks.

The Recovery Unit Implementation Plan identifies the greatest threat to bull trout in the Flathead Core area from non-native species such as lake trout and northern pike. Management agencies would need to work cooperatively to address interactions with non-native species not only in the Flathead Core area but the Swan Core area as well.

#### Multi-scale analysis

Watershed analysis, the precursor to multi-scale analysis, has been a widely applied methodology that was first required for use by the US Forest Service in the Pacific Northwest Region.<sup>5</sup> It was also described and recommended for use in the interior Columbia Basin key and priority watersheds by Pacific Fish (PACFISH) and Inland Fish (INFISH) strategies.<sup>6</sup> As originally envisioned and implemented, watershed analysis was a rigorous procedure developed to ensure that the emerging concept of ecosystem management was incorporated in agency planning and actions.

While multi-scale analysis is a logical continuation and refinement of watershed analysis, it is important to understand differences. Watershed analysis placed a heavy emphasis on methodology and the collection and analysis of data from different disciplines for the purpose of understanding biological and physical processes and how they interacted in specific locations. It was expected to blend socio-economic expectations with the biophysical capabilities of a particular watershed. Resulting analyses could be over 100 pages long and yet still not address integration. When watershed analysis was combined with riparian reserves (Pacific Northwest Region) or Riparian Habitat Conservation Areas (Intermountain and Northern Regions) these components proved successful at preventing actions that harmed riparian reserves. Regarding the Pacific Northwest, Thomas and others noted that strategies in that plan were not as successful promoting active restoration and adaptive management and in implementing economic and social policies set out under the plan 8.

Geographic data sets and analysis have dramatically progressed since those early efforts providing much more analysis capability today. Multi-scale analysis seeks to focus more on the integration of existing information and "provides a basis for integration and prioritization of conservation measures for wide-

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<sup>&</sup>lt;sup>5</sup> USDA Forest Service and USDI Bureau of Land Management. 1994. Final supplemental environmental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. USDA Forest Service, Portland, Oregon, and USDI BLM, Moscow, Idaho.

<sup>&</sup>lt;sup>6</sup> USDA. 1995. Inland Native Fish Strategy: Environmental Assessment—Decision Notice and Finding of No Significant Impact. "Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada." USDA, Forest Service, Intermountain, Northern, and Pacific Northwest Regions. 211 pp.

<sup>&</sup>lt;sup>7</sup> USDA Forest Service and USDI Bureau of Land Management. 1994. Final supplemental environmental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. USDA Forest Service, Portland, Oregon, and USDI BLM, Moscow, Idaho.

<sup>&</sup>lt;sup>8</sup> Thomas, J.W., J.E. Franklin, J. Gordon and K.N. Johnson. 2006. The Northwest Forest Plan: origins, components, implementation experience, and suggestions for change. *Conservation Biology* 20:277-287.

ranging species." Multi-scale analysis does not require new data gathering or data generation. Rather, multi-scale analysis uses available data summaries from relevant resources at sometimes different scales to consider multiple management objectives for the management area. The analysis considers existing conditions, factors limiting aquatic species populations, resource risks, restoration options, and available recovery planning information. Various scales of data help place management issues and opportunities into meaningful context. Efforts mirror the sensitivity and complexity of the issues being addressed.

A multi-scale analysis is an assessment that looks at aquatic species and habitat conditions at different scales and takes those conditions into consideration to inform a decision maker. The analysis considers basin, subbasin, watershed, and reach scale conditions including habitat conditions from the PACFISH/INFISH biological opinion (PIBO) and other stream surveys, factors limiting aquatic species (including non-native species), resource risks, management requirements, restoration opportunities, and interagency coordination with Montana Fish, Wildlife and Parks and the USFWS. A multi-scale analysis provides information useful for assessing project proposals within RMZs.

Management of riparian areas has multiple objectives of providing clean water (minimizing nutrient and sediment inputs), aquatic habitat including temperature, habitat for riparian species, and connectivity across landscapes. <sup>10</sup> Consideration of the scales of management and the potential effects of management would be a key to ensuring the maintenance of ecosystem resilience for riparian systems. <sup>11</sup> Proposed activities within RMZs consider habitat conditions and the function and processes of riparian areas to provide shade, minimize nutrients and sediment and the potential impacts that may occur. Further, the analysis considers which species occur within the stream and the strength of that population.

Multi-scale analysis was used to develop the Forest's Conservation Watershed Network, starting with the scale of the Columbia River Basin. The best available science indicates the Flathead is important for conservation of native fish (bull trout and westslope cutthroat trout) across their range. 12, 13, 14, 15 The Flathead River basin is along the spine of the continent and is predicted to provide cold water into the future due to high elevation and slow climate velocities of mountain streams. 16

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<sup>&</sup>lt;sup>9</sup> USDA. 2014. The Interior Columbia Basin Strategy, Interagency Memorandum of Understanding. A strategy for applying knowledge gained by the Interior Columbia Basin Ecosystem Management Project to the revision of land use plans and project implementation. Forest Service Agreement No. 03-RMU-11046000-007. 6 pp.

<sup>&</sup>lt;sup>10</sup> Lee, B. N.L. Poff, D. Miller, T. Dunne, G. Reeves, G. Pess and M.M. Pollock, 2004. The network dynamics hypothesis: How channel networks structure riverine habitats. *Bioscience* 54: 5. 413–427.

Bisson, P.A., S.V. Gregory, T.E. Nickelson and J.D. Hall. 2008. The Alsea Watershed study: a comparison with other multi-year investigations in the Pacific Northwest. Pages 259-290 *In* J. Stednick, editor. Hydrological and biological responses to forest practices: the Alsea Watershed study. Ecological Studies 199, Springer, New York. <sup>12</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

 <sup>&</sup>lt;sup>13</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.
 <sup>14</sup> Shepard, B.B., B.E. May and W. Urie. 2005. "Status and conservation of westslope cutthroat trout within the western United States." *North American Journal of Fisheries Management* 25, no. 4 (2005): 1426–1440.

<sup>&</sup>lt;sup>15</sup> Muhlfeld, C.C., T.E. McMahon, M.C. Boyer and R.E. Gresswell. 2009. "Local habitat, watershed, and biotic factors influencing the spread of hybridization between native Westslope Cutthroat Trout and introduced Rainbow Trout." *Transactions of the American Fisheries Society* 138:1036–1051.

<sup>&</sup>lt;sup>16</sup> Isaak, D., M. Young, C. Luce, S. Hostetler, S. Wenger, E. Peterson, J. Ver Hoef, M. Groce, D. Horan and D. Nagel. 2016. "Slow climate velocities of mountain streams portend their role as refugia for cold-water biodiversity." *Proceedings of the National Academy of Sciences*. doi:10.1073/pnas.1522429113.

We then looked at the climate shield model<sup>17</sup> and temperature model<sup>18</sup> across the Flathead River basin (6th hydrologic unit code) to look closer where cold water is predicted to persist into the future in the face of climate change. The models both identified that cold water is predicted to persist in many of our local bull trout populations that were previously identified as priority watersheds under INFISH.<sup>19</sup> Therefore, we carried over our priority bull trout watersheds and those watersheds designated as critical habitat by the USFWS<sup>20</sup> into our network.

The forest also needed to take a closer scale look at our westslope cutthroat trout populations at the subbasin level (8th hydrologic unit code). There are many pure populations of westslope cutthroat trout on the forest, unlike many other watersheds across their range where brook trout have either outcompeted them or rainbow trout have hybridized with them. The South Fork Flathead River subbasin is extremely unique for its size in that there are no brook trout or rainbow trout populations above Hungry Horse Dam. The large patch size, proximity to each other, and connectivity (10th and 12th field hydrologic unit code scale) of these populations makes conservation important, as throughout westslope cutthroat trout range, only small fragmented populations exist. 21, 22

Lastly, the forest identified two 12th field hydrologic unit codes in each 8th field hydrologic unit code where storm-proofing would be targeted in the first decade of the plan. Reach scale data, barriers and road data were used to identify watershed for restoration priority while integrating terrestrial restoration priorities for grizzly bear, for example. Another example of multi-scale analysis at a project-level would be to look at habitat conditions and the extent and of intensity of a project proposal if the project proposes activities within RMZs. This type of project analysis considers four scales: (1) habitat conditions (percent fines) at the reach level; (2) bull trout status and habitat conditions in Wounded Buck (hydrologic unit code 12); (3) bull trout status in the South Fork Core (hydrologic unit codes 8) and (4) bull trout status in the Flathead Basin (hydrologic unit codes 6). The project analysis would consider the project impact and status of bull trout in the South Fork relative to the status of bull trout in the Flathead Basin.

### Stormproofing prioritized Conservation Watershed Networks

During the past decade major winter storms, particularly 2011 on the forest and in adjacent Glacier National Park, caused flooding that damaged roads, campgrounds, and other infrastructure. Road networks can impair water quality, aquatic habitats, and aquatic species in a number of ways, often to a greater degree than any other activities conducted in forested environments.<sup>23, 24, 25</sup> Roads intercept

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Northwest Regions. 211 pp.

 <sup>&</sup>lt;sup>17</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.
 <sup>18</sup> Jones, L.A., C.C. Muhlfeld, L.A. Marshall, B.L. McGlynn and J.L. Kershner. 2014. "Estimating thermal regimes of bull trout and assessing the potential effects of climate warming on critical habitats." *River Research and*

Applications 30: 204–216. doi: 10.1002/rra.2638.

19 USDA. 1995. Inland Native Fish Strategy: Environmental Assessment—Decision Notice and Finding of No Significant Impact. "Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada." USDA, Forest Service, Intermountain, Northern, and Pacific

<sup>&</sup>lt;sup>20</sup> USFWS. 2010. Endangered and threatened wildlife and plants; revised designation of critical habitat for bull trout in the coterminous United States; final rule. October 18, 2010. *Federal Register* 75:63898-64070.

<sup>&</sup>lt;sup>21</sup> Rieman, B.E. and J.D. McIntyre. 1995. "Occurrence of bull trout in naturally fragmented habitat patches of varied size." *Transactions of the American Fisheries Society* 124 (3): 285–296.

<sup>&</sup>lt;sup>22</sup> Shepard, B.B., B.E. May, and W. Urie. 2005. "Status and conservation of westslope cutthroat trout within the western United States." *North American Journal of Fisheries Management* 25 (4): 1426–1440.

<sup>&</sup>lt;sup>23</sup> Gucinski, H., M.J. Furniss, R.R. Ziemer and M.H. Brookes. 2001. Forest roads: a synthesis of scientific information. General Technical Report PNW-509, USDA, Forest Service, Pacific Northwest Research Station, Portland, Oregon. 103 pp.

surface and subsurface flows, adding to the magnitude and flashiness of flood peaks and accelerating recession of flows.<sup>26</sup> Road networks can also lead to greater channel incision, increased sedimentation, reduced water quality, and increased stream habitat fragmentation

Increased winter flooding is expected to occur as climate warms on the Flathead National Forest. In addition to more frequent flooding, larger fall rain events and changes in timing and magnitude of runoff are all predicted to be influenced by climate change. <sup>27, 28</sup> The opportunity exists to stormproof prioritized sub-watersheds by adjusting the transportation network to be less exposed to anticipated changes.

Modern road location, design, construction, maintenance, and decommissioning practices can substantially reduce harmful interactions between roads and streams. Forest roads built decades ago were built with a focus on reducing construction cost and often did not employ modern practices. Also, maintenance budgets have not been able to meet road maintenance needs for decades. In addition, critical drainage components like culverts are nearing or have exceeded their life expectancy.

With regard to the aquatic environment, the Revised Plan addresses some of the expected effects of climate change by objectives focused on storm-proofing some of the most important sub-watersheds for at risk species, such as bull trout and westslope cutthroat. The focus area for this work is within the Conservation Watershed Network, as identified in appendix E, with an emphasis on the high priority sub-watersheds of hydrologic unit code (HUC) 12, shown in table C-3.

	<del>-</del>
HUC12 (numeric order)	Name
170102060311	Trail Creek
170102060404	Shorty Creek
170102060405	Upper Whale Creek
170102060406	Lower Whale Creek
170102070203	Granite Creek
170102070301	Middle Fork Flathead River-Bear Creek
170102090601	Sullivan Creek
170102090702	Wounded Buck Creek
170102110206	Lion Creek
170102110303	Goat Creek

C-10

MacDonald, L.H. and J.D. Stednick. 2003. Forests and water: A state-of-the-art review for Colorado. Colorado Water Resources Research Institute Rep. No. 196. Fort Collins, Colorado. Colorado State University. 65 p.
 USDA. 2001. National Forest System road management strategy environmental assessment and civil rights analysis. USDA, Forest Service, Washington, DC.

<sup>&</sup>lt;sup>26</sup> Jones, J.A. and G.E. Grant. 1996. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. *Water Resources Research* 32: 959–974.

<sup>&</sup>lt;sup>27</sup> Wu, H., J.S. Kimball, M.M. Elsner, N. Mantua, R.F. Adler and J. Stanford. 2012. Projected climate change impacts on the hydrology and temperature of Pacific Northwest Rivers, *Water Resour. Res.* 48, W11530. doi: 10.1029/2012WR012082.

<sup>&</sup>lt;sup>28</sup> Stewart, I.T. 2009. "Changes in snowpack and snowmelt runoff for key mountain regions." *Hydrological Processes* 23(1): 78–94.

Stormproofing treatments are focused on infrastructure that would be retained. Treatments include, but are not limited to, the following examples:

- Out-sloping roads
- Adding cross drain and drainage dips at strategic locations
- Removing overburden on pipes on stored road segment in locations at risk of failure
- Storing road segments and removing pipes at higher risk of failure
- Re-aligning road segments off of floodplains and away from stream-sides
- Replacing undersized culverts with larger structures including bridges if needed.

#### Riparian management zones

During forest plan revision, Forest Service personnel created a forestwide riparian RMZ data layer that has been entered to the Forest's GIS data library for future reference. The wetlands were mapped using the National Hydrologic Datasets as well as local GIS databases, including those with existing and potential sites for *Howellia aquatilis* (see RMZ GIS metadata for more details). To create the RMZ layer, aquatic and wetland features were buffered according to specifications of Standard FW-STD-RMZ-01, using the ArcGIS buffer function. Wetland characteristics are confirmed at the project-level, to facilitate site-specific analysis and application of forest plan management direction.

In standard FW-STD-RMZ-01, RMZ delineation for category 3 features is specified as a minimum of 300 feet slope distance from the edge of the mapped wetland, pond or lake. These mapped wetlands provide key habitat for wildlife and contribute toward habitat connectivity objectives. Map B-09 displays these mapped wetland and ponds (including the 300 foot buffer), using the National Hydrologic Datasets and local databases as previously described. During project-level analysis, the wetlands displayed within this GIS layer are used to facilitate initial identification of wetlands where this standard may apply, with specific location and configuration of RMZs for these wetlands defined at the site-specific level. For wetlands that are not mapped on Map B-09, delineation of RMZs would at a minimum follow direction for category 4 features in FW-STD-RMZ-01.

RMZs are not suitable for timber production, but timber harvest may occur where it would be consistent with desired conditions, standards, guidelines, management areas and laws (e.g., streamside management zones). Preferred treatments promote desired ecosystem characteristics, integrity, and resilience of water, fish, wildlife, and soils. In many areas, diverse structure in RMZs are promoted through natural ecosystem processes such as wildfire, insects or disease. However, in areas where it is consistent with standards and guidelines, vegetation management activities (such as prescribed fire, precommercial or commercial thinning or small group selection) may be used to meet desired conditions, promote diversity or increase the long-term resilience of RMZs. For example, in areas where it is desirable to create larger old growth patch sizes or improve connectivity of existing old growth patches, precommercial thinning may occur to increase the diameter growth of retained trees. Small group selection harvest may be used to create small openings to increase tree species diversity (e.g., hardwood trees with a dense shrub understory), so that RMZs are not all of one age or composition, which would make them less susceptible to widespread loss of live trees at one time. Where it would not be detrimental to fish or water quality, daylight thinning may occur around individual hardwood trees to help withstand competition by conifers.

## Threatened species, endangered species, wildlife species of conservation concern (SCC) associated with aquatic or riparian habitats

#### Black swift (SCC)

Possible strategies in support of FW-GDL-WL SCC-04 that may be used to reduce disturbance during nesting activities of the black swift include:

- Participating in cooperative efforts to survey waterfalls that provide known or potential breeding sites
  for black swifts to determine species presence and baseline habitat conditions, including canopy
  shading and water flow throughout the nesting season.
- Monitoring known nesting sites to identify any potential management issues.
- Timing activities that nesting swifts are not accustomed to (such as loud noise that may be associated with some types of trial maintenance) so that they do not occur within 500 feet of known nesting colonies during the nesting season.

#### Harlequin duck (SCC)

Possible strategies in support of FW-DC-WL SCC-01 and FW-GDL-WL SCC-04, to help protect habitat and reduce disturbance on nesting stream reaches during nesting season include the following:

- Participating in cooperative efforts to survey current, historic, and potential mountain streams with characteristics that can provide habitat for harlequin ducks.
- Monitoring presence of harlequin duck pairs and broods during the nesting and brood rearing seasons (For expanded details on these recommendations, see the work of Cassirer and others.<sup>29</sup>
- Maintaining a buffer of dense tree and shrub cover between nesting stream reach and potential source of disturbance (if available).
- Maintaining dense vegetation and/or high densities of down logs adjacent to stream reaches with known harlequin duck nesting sites to provide cover, protection from disturbance, and protection from predators.
- Managing watersheds around nesting stream reaches so that early season flows are not increased (which decrease reproductive success) and so that stream flows that support aquatic insects for forage are maintained.
- Avoiding building new roads in RMZs adjacent to nesting stream reaches.
- Evaluating existing roads near nesting stream reaches for decommissioning or placement into stored service.
- Retaining stream barriers if present between nesting stream reaches and downstream areas, as they may help to reduce competition or protect nesting harlequins from predatory fish.
- Assessing proposed mineral exploration and development in watersheds around nesting stream
  reaches for impacts to harlequin ducks and requiring provisions for harlequin ducks and their habitat
  needs in minerals management plans (including leasable, locatable, and salable minerals).

<sup>&</sup>lt;sup>29</sup> Cassirer, E.F. and C.R. Groves. 1994. Ecology of Harlequin Ducks in Northern Idaho. Idaho Department of Fish and Game. Boise, Idaho. 63 pp.

• Minimizing human disturbance along nesting stream reaches during the early breeding season (May–June) and encouraging (either directly or indirectly) recreational boating, floating, or fishing activities to use streams other than harlequin duck breeding streams during this time period.

- Avoiding constructing new trails or campgrounds along breeding stream reaches.
- Educating the public and land managers about harlequin duck biology and potential disturbance issues.

## Other wildlife associated with aquatic habitats, wetlands, and riparian management zones

#### Bald eagle nests and screening vegetation

Montana Fish Wildlife and Parks coordinates a cooperative effort to monitor bald eagle nesting territories, nest locations, and annual production. Many, but not all, bald eagle nests are in located in RMZs. As bald eagles are known to use the same very large nest trees and alternate nest trees for very long periods of time, it is important that they are protected from wildfire, insects, and disease. Thinning around very large potential or active bald eagle nest trees may be desirable to protect them from stand replacing wildfires, but if thinning occurs it is important to coordinate it with a wildlife biologist and to maintain visual buffers between nest trees and potential human disturbance. Work around nests is best accomplished in the non-nesting period (August 16<sup>th</sup> to January 31<sup>st</sup> unless it is not practical to do so.

Montana's Bald Eagle Management Plan<sup>30</sup> (or subsequent update) recommends to maintain visual screening between sources of human disturbance and known nests, roosts, and feeding areas where bald eagles concentrate unless topography, ecological characteristics, historical and proposed land use, human activity patterns, and the nesting pair's level of tolerance for disturbance indicate otherwise. Recommended activities for visual buffer maintenance and enhancement include: (1) managing forest and riparian habitats to protect and enhance important habitat components (e.g., perch trees and visual screening); (2) placing new construction (buildings, trails, boat launches/marinas, etc.) only in areas where visual buffers around nests can be retained; and (3) retaining a natural buffer around active nests, alternate nests, and large live trees and snags during fire protection activities that meet wildland-urban interface safety requirements and recommendations while providing visual security for bald eagles.

Nesting territories are identified in a statewide database maintained by Montana Fish, Wildlife and Parks. If projects are proposed in the vicinity of nest trees, the Flathead National Forest assesses the habitat and potential for disturbance through the National Environmental Policy Act process, considering plan components as well as visual screening recommendations on a site-specific basis.

Examples of potential strategies that support FW-GDL-WL SOI-04 include retention of dense, tall stands of trees (if available) between nests and timber harvest units, roads, or boat launches. If a visual buffer is not present, then the following strategies for maintaining a distance buffer may be used (Montana Bald Eagle Working Group, <sup>31</sup> or subsequent update):

• Potentially disturbing activities within one-half (0.5) mile of active and alternate nests (for territories occupied within the last 5 years) are best timed to avoid the nesting time period specified in the

<sup>&</sup>lt;sup>30</sup> Montana Bald Eagle Working Group. 2010. Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan, 1994. C.A.M. Hammond (ed.). Montana Fish, Wildlife and Parks, Helena, Montana. 13 pp.

<sup>31</sup> Ibid.

guideline (although some activities may produce less disturbance and recommended distances might be decreased in areas where visual buffers obstruct the direct line of sight between activities and nests).

- In addition, in areas where sources of disturbance pre-date eagle occupancy, where eagles have developed a tolerance for routine human activities, or where activities similar to the proposed activity exist distance buffers may be reduced. Reductions to recommended distance buffers are best considered through consultation with a qualified biologist, taking into account site-specific plans.
- During nesting season, a distance of one-quarter (0.25) mile or 1,000 feet above nests is recommended for helicopters and aircraft, except when necessary for biologists to conduct bald eagle nest surveys. Coordination of bald eagle nest surveys among agencies/companies reduces duplicate surveying, and also decreases additional disruption of nesting activities.

In the absence of a visual buffer, recommended distance buffers for activities during the nesting season include the following:

- One-half (0.5) mile for:
  - Construction of new marinas or boat launches with routine use by six or more boats.
  - ♦ Any use of explosives or activities that produce extremely loud noise, such as blasting, use of jackhammers or gravel crushing equipment, shooting ranges, or fireworks.
  - Forest management activities that include harvesting and heavy truck traffic in areas that do not normally have that type of activity.
  - Construction of new, above ground power and utility lines.
- One-quarter (0.25) mile for:
  - Any construction of infrastructure such as roads and trails including dozer lines for fire management activities, except when specifically constructed to save a bald eagle nest from fire.
  - Forest management activities to including timber harvest layout, snag removal, prescribed fires, planting, and thinning.
  - ♦ Concentrated recreation activities including hiking, fishing, hunting, camping, rafting, wildlife watching, biking, and motorized activities including automobile use, off-road vehicle use, and boat or personal watercraft use that involves stopping (e.g., camping, anchoring fishing boats) or constant human use (e.g., popular hiking trails). Signage may be needed to inform people to avoid stopping in the buffer area during the nesting season.

#### **Great blue heron nesting rookeries**

Possible strategies in support of FW-DC-WL SOI-01 and FW-GDL-WL SOI-04, to help protect habitat and reduce disturbance during nesting season for great blue heron, include the following:

- Similar to bald eagles, development and retention of very large cottonwood trees near large rivers and lakes is important for great blue heron.
- During the nesting season, where cottonwood trees are actively used by nesting colonies of great-blue herons, a 300 foot buffer zone from the periphery of the colony is recommended when conducting projects that may cause disturbance to nesting birds (e.g., concentrated recreation activities that involve stopping, helicopter or fixed wing flights within 1,000 feet, blasting).

#### **Common loon nesting territories**

Nesting territories are identified in a statewide database maintained by Montana Fish, Wildlife and Parks. The Forest Service works cooperatively with common loon public interest groups, other state and federal agencies, the Montana Natural Heritage Program, and Montana Fish, Wildlife and Parks to monitor potential and known loon nesting lakes. At active common loon nest sites, nests could be protected a variety of ways, for example, through loon education personnel, shoreline signs, floating signs and/or nesting platforms, in cooperation with the Common Loon Working Group. If projects are proposed within 400 yards of a nest site that involve loud noise, boat use, walking, riding, or stopping by the nest site, the habitat and potential for disturbance can be assessed through the National Environmental Policy Act process, considering plan components as well as other possible strategies that address local concerns or risk factors, to ensure long-term availability of each nesting territory. Additional strategies that may be used in support of FW-DC-WL SOI-01, 04 and FW-GDL-WL SOI-04 are recommended by the Common Loon Working Group (see appendix C of the conservation plan, 32 or subsequent update) as follows:

- Identifying lakes where water fluctuation is a primary cause of nest failure and coordinate with local water control agencies to mitigate water fluctuations where possible. Otherwise, consider the use of floating islands.
- Recording locations of all current, past, and suspected nesting and nursery sites.
- Identifying location, type, and impacts of current and probable future disturbance on nesting and nursery habitat.
- Explaining and diagraming floating sign placement around known nest locations and the placement of onshore signs.
- Describing historic and current public issues, concerns, and conflicts (e.g., lakeside trails, float plane use, fishing pressure).
- Identifying the amount of information and education effort needed.
- Reducing impacts of existing and future shoreline development on lakes that provide quality loon habitat.
- Maintaining and enhancing mitigation efforts to minimize effects of shoreline disturbance on nesting loons.
- Having federal agencies, state agencies, and private landowners apply the Loon Conservation Plan
  and best management practices before choosing sites for recreation facilities, homes, or other
  developments.
- Implementing generic recommendations and considerations for the use of artificial nesting platforms and floating signs.

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<sup>&</sup>lt;sup>32</sup> Hammond, C.A.M. 2009. Conservation Plan for the Common Loon in Montana. Montana Department of Fish, Wildlife and Parks, Montana Common Loon Working Group. Kalispell, Montana.

#### Veery

The veery is found in valleys along major rivers and lakes where there are deciduous forests intermingled with patches of dense shrubs or a dense shrub understory. Most veery habitat occurs on other land ownerships, but where it does occur on the Flathead National Forest, possible strategies in support of veery habitat (FW-DC-RMZ-01) include the following:

- Allowing periodic flooding (including by beavers) to promote sprouting of hardwoods and growth of dense shrubs
- Locating small group selection harvest (generally less than 0.5 acre) in the outer half of RMZs where there is a higher probability for successful hardwood regeneration, provided doing so does not conflict with desired conditions for aquatic species.

#### Wildlife habitat connectivity in riparian management zones

Possible strategies that promote connectivity needs of wildlife within RMZs include the following:

- When trees in RMZs die, leaving a variety of them, in both size and number, onsite provides downed
  woody material and duff on the forest floor, which provides cover and habitat connectivity for small
  mammals, reptiles, and amphibians.
- When harvesting timber adjacent to RMZs, treatments can be designed to reduce the risk of excessive amounts of blowdown.
- If openings are created in RMZs (either through natural processes or through vegetation management treatments that are consistent with RMZ standards and guidelines), maintaining cover of live trees and shrubs in adjacent areas (if available) promotes connectivity until cover of shrubs and smaller trees is restored in RMZ openings.
- Retaining cover patches (if available), in saddles between stream headwaters provides animals protected movement options from watershed to watershed.

## **Terrestrial Vegetation**

The following subsections describe potential management strategies and possible actions, at both the landscape and stand level, for plan components related to the terrestrial vegetation. These strategies and actions are intended to provide guidance for plan implementation, and represent possibilities, preferences or opportunities, rather than obligatory actions. Under an adaptive management approach, proposed strategies and actions are dynamic, i.e., changeable, augmentable, or replaceable, so as to be responsive to results of new research, practical experience, and other information and observations. In association with these strategies, refer also to appendix D for information on biophysical settings and species habitat associations.

## Desired conditions — general information

The desired conditions (DC) in the plan for vegetation components describe, to the best of our ability, what is desired for maintaining ecosystem integrity, while contributing to social and economic sustainability (as required by the 2012 planning rule). Analysis of natural range of variation is the underpinning for the desired conditions, with integration of additional factors, such as habitat needs for at-risk wildlife species; existing or anticipated human use patterns; consideration of changing climate; and ecosystem services that may be desired or expected of the forest (such as reduction of fire hazard or production of forest products).

Desired conditions for vegetation should be viewed and interpreted from short-term (i.e., the "life of the plan," which is 15 years) and long-term perspectives. Vegetation change can be rapid (such as with fire) or slow and gradual (such as with succession). Ecological, social and economic sustainability concepts require a long-term perspective for appropriate interpretation and evaluation.

A number of desired conditions for vegetation characteristics are expressed, which range from forestwide to specific biophysical settings. Vegetation conditions anywhere within this range would be considered to meet the desired condition. Fluctuations in vegetation conditions over time are expected. Managing a particular vegetation characteristic at the upper, lower or mid-point of the desired range may be determined to be appropriate, as influenced by other ecological, social or economic objectives. Monitoring assists in evaluation of vegetation change over time, and supports an adaptive management approach to forest management (36 CFR 219.12).

#### Objectives — possible actions and strategies

Possible actions to achieve the objectives for terrestrial vegetation are exampled below. This list is not inclusive of all possible actions, but represent those most likely to positively contribute to the specific objective. Strategies could include the use of single methods or practices, or combinations of methods and practices. However, the specific actions chosen would depend on numerous factors, such as site-specific forest conditions and other management objectives for the area. Additionally, treatments may be designed to meet more than one objective, for example, planting western white pine seedlings would meet both objectives 01 and 02.

**FW-OBJ-TE&V-01.** Vegetation management treatments on 62,000 to 174,000 acres forestwide to maintain or move towards achieving desired conditions for coniferous forest types and associated wildlife species. Possible actions include the following:

- Using regeneration harvest methods, implementing even-aged, two-aged or uneven-aged silvicultural systems (e.g., clearcut, seed tree, shelterwood or group/single tree selection)
- Using intermediate harvest methods (e.g., commercial or precommercial thinning, sanitation or salvage cut)
- Planting conifers to reforest areas after harvest or fire
- Using mechanical methods (e.g., excavator scarification) or prescribed fire to prepare sites for reforestation
- Conducting post-fire salvage harvest or salvage after epidemic insect infestations
- Managing fire (i.e., prescribed fire and wildfire) to achieve desired vegetation structure, composition, pattern and function
- Conducting mechanical treatments including commercial and noncommercial treatments to alter forest structure and fuel loadings.
- Treating insects and disease using integrated pest management practices.

**FW-OBJ-TE&V-02**. Vegetation management treatments on 6,000 to 21,000 acres of forest to contribute to restoration of resistant western white pine and achieve desired conditions for this species presence across the landscape. Possible actions include the following:

- Pruning or daylight thinning western white pine to reduce incidence of blister rust
- Planting of rust-resistant white pine to reforest areas after harvest or fire

#### Management areas

#### General Forest MAs 6a, 6b, 6c

Vegetation management activities are expected to be readily visible and play a dominant role in affecting vegetation conditions across all the general forest management areas. This includes regeneration and intermediate harvest treatments, tree planting, non-commercial thinning, fuel reduction activities, cone collection, pruning, and prescribed fire. MA 6a is designated unsuitable for timber production because of the high level of other resource considerations or site limitations that would make it difficult to ensure a regulated timber harvest level. MAs 6b and 6c are suitable, with moderate and high intensity timber harvest levels respectively. As with MA 6a, suitability is related to the degree of other resource considerations expected within the management area, and associated limitations on both amount of area that might be treated at one time, or to the rate at which the area may be entered for treatment over a time period. Stand level treatment methods and prescriptions would be expected to be similar in MAs 6a, 6b, and 6c.

#### Focused Recreation MA 7

Most of the acres within MA 7 are designated suitable for timber production. The intensity of expected timber harvest is stated in the description under each of the MA 7 areas that are suitable for timber production. Some areas are moderate intensity (i.e., equivalent to MA 6b) and some are high intensity (i.e., equivalent to MA 6c). Expectations for vegetation management activities within these areas are the same as described in the General Forest MAs 6a, 6b and 6c, above.

#### MAs that are designated unsuitable for timber production

MAs that are designated unsuitable for timber production, but where timber harvest is allowable to meet desired vegetation conditions include MAs 2a and 2b – (the scenic and recreation segments of designated and eligible wild and scenic rivers) and MAs 5a, 5b, 5c, 5d (Backcountry). The vegetation desired conditions that are most likely to apply in these management areas include:

- FW-DC-TE&V- 01, 02, 03, 04. These desired conditions are associated with developing and maintaining resilient forests with composition, structure, and pattern of vegetative conditions that contribute to the habitat need of plant and animal species.
- FW-DC-TE&V- 08, 09, 10, 11, 12, 13, 14, 19. These desired conditions describe forest composition and structure (i.e., size classes, large trees, forest density) and pattern that would contribute to the overall goal of maintaining/achieving forest and ecosystem resilience.
- FW-DC-TE&V- 21, 22, 23; and FW-DC-FIRE- 03, 04, 05. These desired conditions describe the desired role of fire across the forest landscape, and its contribution towards creating desired ecological conditions.

### Coniferous forest types

#### **General strategies**

The following strategies related to forest vegetation could be considered for application at a programmatic or project-level stage to support the maintenance or achievement of desired conditions, standards and guidelines for coniferous forests.

 Developing a set of integrated target stands for the Flathead National Forest provides a consistent basis for the development of site-specific vegetation treatment prescriptions. Such target stands could integrate elements of vegetation composition and structure with wildlife habitat, fire and fuels management, soil and water resources and socioeconomic aspects (e.g., recreation, scenic integrity, timber production). The desired conditions and other forest plan components provide a framework and footing for development of these target stands.

- Considering climate change when developing elements of site-specific silvicultural prescriptions, for example, in choosing species to plant and determining planting densities. For information on forest conditions and forest management strategies related to potential climate change that are relevant to landscape and stand level prescriptions on the Flathead National Forest, refer to documents produced by the Northern Rockies Adaptation Partnership (NRAP),<sup>33</sup> the Reforestation-Revegetation Climate Change Primer for the Northern Region (<a href="https://ems-team.usda.gov/sites/fs-r01-rrm/SitePages/Silviculture.aspx">https://ems-team.usda.gov/sites/fs-r01-rrm/SitePages/Silviculture.aspx</a>), and other publications as they are available.
  - Evaluating areas proposed for vegetation management activities for the presence of occupied or suitable habitat for threatened and endangered plant species, including conducting pre-field review and field surveys, provides opportunities for mitigation and protection to maintain occurrences and habitats that are important for species sustainability.
  - Completing effectiveness evaluations of fuel treatments helps to understand how hazardous fuels treatments affect wildfire behavior, fire severity and fire suppression effectiveness.
- Thinning in immature stands, where possible, improves individual tree and stand growth rates, and improves short- and long-term stand resilience. On the Flathead, these stands may be in sapling, small, or medium tree size classes. See additional discussion located under the Old Growth Forests and Old Growth Habitat section of this appendix.
- Choosing strategies that promote the increase of the following important species in stand and landscape level prescriptions, where treatment and site conditions are suitable:
  - ◆ Planting ponderosa pine, on the warm dry biophysical setting, where it is often needed to ensure its successful establishment.
  - Planting western larch, if a reliable seed source is not present especially on the warm moist and cool moist to mod dry biophysical settings, to ensure successful establishment. Thinning western larch in the sapling stage may also be needed to ensure continued presence and growth.
  - Creating suitable sites for rust-resistant western white pine, especially on the warm moist biophysical setting, and promoting establishment and growth through harvest, burning or mechanical site preparation; planting of rust-resistant seedlings; thinning; and pruning of young sapling trees.
  - Focusing on sites where western red cedar currently has, or has the potential to achieve, larger sizes and, possibly, late successional or old growth habitat in the future.
  - Using a variety of restoration treatments for whitebark pine e.g., planting, thinning, and fuel reduction in stands that contain phenotypically rust-resistant trees.

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<sup>&</sup>lt;sup>33</sup> Keane, R.E., M.F. Mahalovich, B. Bollenbacher and others. 2016. Effects of climatic variability and change on forest vegetation *In* J.E. Halofsky, D.L. Peterson and L. Hoang (eds.). Climate change vulnerability and adaptation in the Northern Rocky Mountains. Gen. Tech. Rep. RMRS-GTR-xxx. Fort Collins, Colorado: USDA, Forest Service, Rocky Mountain Research Station. In press, March 2016. http://adaptationpartners.org/nrap/index.php.

#### Strategies specific to biophysical setting

#### Warm dry biophysical setting

In the warm, dry biophysical setting, the following vegetation management strategies focus on maintaining or increasing representation of early seral, shade-intolerant, drought and fire tolerant, insect/disease resistant species. Specific activities may include timber harvest, prescribed fire, planting, precommercial thinning, and commercial thinning.

- Thinning young stands helps to encourage growth and vigor of trees, and develops future large diameter ponderosa pine, western larch and Douglas-fir. This creates forest compositions and structures better able to survive future fire, insects, disease, drought and other disturbances, and provides seed sources for future forest regeneration after disturbance.
- Designing treatments can be done in a way that favors the retention and increases the proportions of ponderosa pine and, on more mesic sites, the retention and increase of western larch.
- Reducing stand densities and inter-tree competition helps to increase resilience to drought that may be associated with future climates and meets desired conditions with respect to fire behavior.
- Trending toward an increase in the average patch size of early successional forest may be accomplished through regeneration harvest or prescribed burning.
- Timber harvest and prescribed fire can be designed to create a landscape mosaic with a variety of canopy cover classes, dense understory thickets of trees and shrubs, and gaps in the forest canopy. Understory thickets can be left in areas where they do not act as ladder fuels that carry fire into crowns of trees. Ponderosa pine and Douglas-fir live trees and snags, greater than 20 inches d.b.h., can be retained where available.

Key winter habitat areas for white-tailed deer have been identified for geographic areas in the Forest Plan (these areas may also be used in winter by elk or moose or in spring by mule deer). To implement GA-HH-DC-02, GA-MF-DC-06, GA-NF-DC-09, GA-SM-DC-05, GA-SF-DC-04, GA-SV-DC-05), in areas mapped as white-tailed deer and elk winter habitat by Montana Fish Wildlife and Parks (typically the warm-dry biophysical setting or warm-moist with ponderosa pine), the strategies described could be integrated with the needs of winter habitat for deer. However, stands intended to provide snow intercept cover during harsh winters need to retain sufficiently dense forest canopy. The density of trees needed to provide snow intercept cover varies according to tree species composition and elevation and is best determined on a site-specific basis. Examples of stand and landscape-level prescriptions and strategies that provide sufficient snow intercept cover include the following:

- In portions of the Swan Valley where the desired condition is to maintain snow intercept cover for big game, merchantable Douglas-fir trees of intermediate size may be harvested to reduce the stand basal area to 80 or less; creating parklike forests with Ponderosa pine and Douglas-fir in the uppermost canopy, to create a stand structure that is more resilient to drought and stand-replacing fire, while meeting the needs of deer and elk.
- Another possible strategy would apply in the Firefighter area, where elk now use higher elevations in winter due to flooding of Hungry Horse Reservoir. In this area, lodgepole pine stands provide snow interception. Because lodgepole has a relatively small crown, a higher density of trees would need to be retained within the stand. At the landscape scale, consideration could be given to both short- and long-term desired winter range habitat conditions. This may include strategically locating regeneration harvest areas (where conversion to more desired species, such as Douglas-fir may occur) among unharvested areas (that remain to provide snow intercept cover).

• Another consideration is the steepness of the slope and its aspect. In the Dry Park and Horse Ridge big game winter habitat area near the South Fork Flathead River, steep west-facing or south-facing slopes are used by wintering elk even though they have very little tree cover. These slopes receive more sun, even in winter, so not much snow accumulates. In these areas, it is important to avoid prescribed burning or slashing trees on benches where animals bed down.

• In all types of winter habitat, patches of dense trees in the understory, to provide wind protection, and arboreal lichens, for feeding, are desirable. Dense patches of small trees and shrubs could be retained in areas that are not adjacent to structures where it does not conflict with fire management desired conditions. Prescribed fire may also be used to promote an understory consisting of small patches of grasses and forbs, shrubs, and small trees.

#### Warm moist biophysical setting

Within the Flathead's warm-moist biophysical setting, vegetation treatment selections generally favor the retention and increase of western larch, rust-resistant western white pine, ponderosa pine, and cedar on more mesic sites. Specific activities could include timber harvest, prescribed fire, planting, precommercial thinning, and commercial thinning, consistent with big game winter range desired conditions. Example actions include:

- Promoting increase in presence of western white pine by planting in harvest units, or areas burned by fire, and thinning or pruning within existing sapling stands.
- Thinning young stands to encourage growth and vigor of trees, and developing future large diameter western larch, Douglas-fir, western white pine and ponderosa pine. These activities create forest compositions and structures better able to withstand fire, insects, disease, drought and other disturbances, as well as providing seed sources for future forest regeneration after disturbance.
- Conserving existing large live trees and snags, greater than 20 inches d.b.h., where available.
- Trending toward an increase in the average patch size of early successional forest, which may be accomplished through regeneration harvest or prescribed burning.
- Reducing stand densities and inter-tree competition to increase resilience to anticipated future climates and to meet desired conditions with respect to fire behavior.
- Maintaining overstory shade to protect understory trees, while reducing stand densities overall to
  promote tree growth and development into larger diameter future trees in cedar-hemlock sites, where
  it is desired to encourage presence of these species.
- Protecting existing old cedar groves by managing surrounding stands to lower the risk of high severity fire. Management activities may include reducing tree densities and downed woody material.

See also possible strategies for big game winter habitat in the Warm-dry Biophysical Setting section of this appendix (most winter habitat is located in warm-dry or warm-moist settings).

#### Cool moist-moderately dry biophysical setting

Within the Forest's cool-moist to moderately dry biophysical setting, vegetation treatment selections would generally favor the retention and increase of western larch and Douglas-fir, and of rust-resistant western white pine in the overstory on the more mesic and warm sites within this setting. Example actions include:

• Promoting increase in presence of western white pine by planting in harvest units or areas burned by fire, and thinning/pruning in existing sapling stands.

- Thinning young stands to encourage growth and vigor of trees and to develop future large diameter western larch, Douglas-fir, and western white pine in the upper canopy layers, while retaining subalpine fir and spruce in the understory to maintain/develop multi-story hare habitat. This forest structure may be more vulnerable to high severity fire and less resilient to drought, but provides important habitat conditions for the threatened Canada lynx. The presence of large diameter overstory trees of fire-tolerant, desired species compositions improves tree survival in moderate or mixed severity fires and provides a potential seed sources for post-fire regeneration. Promoting western larch may also reduce losses due to insects and disease.
- Conserving existing large live trees and snags greater than 20 inches d.b.h., where available.
- Reducing stand densities and inter-tree competition in the wildland-urban interface, or in the stem
  exclusion structural stage, to increase resilience to anticipated future climates and to meet desired
  conditions with respect to fire behavior. In other areas, increasing the presence of western larch,
  particularly as larger tree components and in overstory canopy layers, and in areas dominated by
  lodgepole pine, to promote species tolerant of insects, disease and fire and with the potential to
  provide high quality habitat for cavity nesting/denning species.
- Creating openings in areas of moderately to densely stocked mid-successional forest, particularly areas dominated by lodgepole pine to increase forest structure and species diversity. Regenerating fire tolerant species, especially western larch or western white pine (where suited).

#### Cold biophysical setting

Within the Flathead's cold biophysical setting, vegetation treatment strategies generally favor the retention and increase of whitebark pine. Possible strategies that may be used include the following:

- Identifying whitebark pine trees and stands that contain phenotypically resistant trees for cone collection, seed production for natural regeneration, and scion and pollen collection,.
- Reducing stand density and fuels by thinning of felling of trees, to improve stand resilience and lower fire hazard
- Conducting insect control activities, such as applying pheromones packets
- Thinning sapling or larger-sized whitebark pine stands
- Planting whitebark pine seedlings or seeds
- Conducting prescribed burning on sites that best support whitebark pine establishment and growth (either natural regeneration-seed caching by Clark's nutcracker, or by planting).

## Live tree retention within regeneration harvest units

Clarifying information and potential management strategies that may be used to meet the live tree retention guideline FW-GDL-TE&V-11 are listed below.

• The primary intent of this guideline is to promote the development and emphasize the importance of the large live tree forest structural component in the ecosystems and forests of the Flathead National Forest. It is a key component contributing to maintenance/creation of forests that are resilient in light of future uncertainty and to habitats important for the long-term persistence of native plant and animal species. The secondary intent is to retain the trees that are selected for leaving under this guideline indefinitely (e.g., not removed in a subsequent harvest activity) to provide desired conditions over the

long term. In timber harvest areas, in the event that these retained trees fall over or are felled (e.g., for safety reasons), they would generally be left onsite to provide coarse woody debris habitat.

- Selection of leave tree species, sizes, amounts, distribution, and conditions is based on the multiple reasons and values associated with retention of live trees that are stated in both FW-DC-TE&V-13 and FW-GDL-TE&V-11 (e.g., improve forest resilience, future potential seed sources, wildlife habitat, etc.).
- Consideration of long-term forest conditions are as important as short-term when developing leave tree retention prescriptions. For example:
  - ♦ Leaving smaller diameter trees of desirable species and vigor that persist on the site indefinitely may be preferable to leaving larger size trees of less desirable species or condition, because of the long-term potential to achieve desired structural diversity and a very large (> 20 inch d.b.h.) tree component on the site in the future.
  - Potential for development of late successional or old growth forest.
  - ♦ The intent is not to leave sapling or small diameter (i.e., < 9 inches d.b.h.) trees in place of larger trees to meet the guideline; however, retention of smaller trees may be part of the prescription to meet other desired forest conditions.
- Prescriptions to meet this guideline may vary considerably. Site-specific conditions and project-level
  multiple resource objectives are expected to be integrated to determine leave tree density, patterns,
  species, sizes, conditions (i.e., growth and vigor), etc. Alternative prescriptions to this guideline may
  be developed and documented based on these site and project-specific factors.
- Examples of site-specific conditions and considerations that may influence the leave tree retention prescription include the following:
  - ♦ Influence on growth and development of newly regenerated trees, considering, for example, the shade intolerance of species such as western larch, ponderosa pine and western white pine. It is not desirable to leave densities of overstory trees that unduly inhibit growth and development of newly regenerated stands. Leaving scattered small groups or patches of leave trees may be an option.
  - ♦ Existing insect or disease conditions that would affect long-term persistence of live leave trees, or have undesirable effects to the regenerated stand. For example, trees heavily infected by dwarf mistletoe; root disease presence. Conversion to species that are less vulnerable to the insect or pathogen may be an option.
  - ◆ Logging, slash removal or site preparation methods may limit species, size, or distribution of leave trees. Operational limitations of logging methods may influence location or pattern of leave trees. Additionally, the potential for leave tree mortality (i.e., snag creation) with broadcast burning needs to be considered. If maintaining live leave trees on the site is deemed to be especially important, or if particular leave trees are of high value (i.e., very large diameter ponderosa pine) methods to increase probability of survival may be needed, for example, removing slash from the base of trees prior to burning.
  - ◆ Trees may be retained for reasons other than the primary intent of the guideline, for example: trees with decay, or in poor condition, may be desirable for future snag and downed wood habitat; trees may contribute to scenic integrity or other social benefits; trees may provide shade for newly regenerated seedlings; and understory trees that provide desired forest structures in the short or long term.

#### Old growth forests and old growth habitat

Old growth forest is defined by specific structural attributes and other characteristics as described in the Forest Service publication, *Old growth forest types of the Northern Region*.<sup>34</sup> Old growth habitat includes stands that meet the definitions for old growth forest, in addition to stands that may have some of the structural or other stand characteristics that provide habitat for wildlife species associated with old growth but do not fully meet definition for old growth forest. For example, old growth habitat may include stands that contain large diameter trees but these trees are younger than required to meet old growth forest definitions (refer also to the glossary).

#### Desired condition FW-DC-TE&V-15 – old growth forest

A primary function of this desired condition is to highlight the dynamic nature of this forest structure class and the importance of planning for long-term development of old growth forest, as much as protecting existing old growth forest. It is understood that old growth forest may be lost to fire, at times, and be gained through natural succession of vegetation. Forest plan direction for old growth forest acknowledges and supports the enhancement of the successional process towards old growth forest that could be achieved through management activities.

# Desired conditions FW-DC-TE&V-11, 12, 13 – forest size classes and very large tree subgroup

In addition to the desired condition for old growth forest (FW-DC-TE&V-15, above), these desired conditions relate to forest and tree size classes are intended to contribute to the needs of wildlife species associated with old growth habitat. The very large tree size class desired conditions in FW-DC-TE&V-11 and -12 could be reasonably expected to correlate closely with old growth habitat. The very large tree subgroup described in FW-DC-TE&V-13 further addresses the retention and development of very large trees, which is expected to contribute to old growth habitat.

#### **Guideline FW-GDL-TE&V-07**

The key vegetation management direction in this guideline is to (1) increase the resilience of old growth forest to potential future disturbance, which may result in loss of old growth characteristics (e.g., high severity wildfire or epidemic insect outbreaks); (2) increase the size and shape of old growth forest patches so that there are portions 300 feet or more from early successional forest edge; and (3) promote the long-term (i.e., beyond the plan period) development of future old growth forest or old growth habitat. Guidance and potential strategies to achieve this guideline are presented in following subsections:

#### Landscape or watershed level

In areas where it is desirable to alter old growth forest conditions at the watershed level (e.g., the size, shape, structure and connectivity of old growth forest patches), a possible management strategy may include the following considerations:

• When planning timber harvest, retain stands adjacent to existing old growth forest stands that would provide future old growth in the shortest time frame possible. Selection of forest stands for

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<sup>&</sup>lt;sup>34</sup> Green P., J. Joy, D. Sirucek, W. Hann, A. Zack and B. Naumann. 1992. Old growth forest types of the Northern Region. Errata corrected 2005, 2007, 2008. USDA, Forest Service, Northern Region Document Number R-1 SES 4/92. Missoula, MT. 609 pp.

development of future old growth may be emphasized in watersheds where existing old growth forest or habitat acres are less than the desired conditions at the forestwide scale; where shape of old growth forest or habitat patches is largely linear and narrow; where individual patches are relatively small (e.g., average less than 100 acres), and/or where connectivity of patches is poor. Examples strategies to develop future old growth are listed under the following section, "Stand level."

- At the project level, assess old growth patch size by analyzing the amount of high contrast edge between old growth habitat and openings.
- Consider treatment of forest adjacent or near old growth stands to result in reduced fire hazard, alter
  potential fire spread or fire severity, or reduce potential insect or disease outbreak that may spread to
  old growth forest.

#### Stand level

Long term persistence of old growth forest on the Flathead National Forest is closely tied to forest plan components and guidance related to development of resilient forests, with particular focus on promoting presence of fire resistant, large diameter, long-lived trees. In other words, many of the desired conditions for vegetation characteristics, and the standards and guidelines developed to achieve those desired conditions, also contribute to the achievement of this direction related to old growth, including the following:

- Vegetation composition desired increase of ponderosa pine, western larch, western white pine (long-lived, large diameter, resilient to fire)
- Forest size class desired increase in large and very large size class
- Live tree retention guideline (refer to the discussion presented under the "Live tree retention within regeneration harvest units" section earlier in this appendix)
- Snag and downed woody material.

Any stand where current or potential tree growth, species composition, or other forest components are conducive to development of old growth forest or habitat over time may be considered for prescriptions to encourage that development. Example prescriptions include:

- Managing mature or late successional forests that do not meet the definition for old growth forest, but have characteristics of old growth that are important for wildlife (e.g., large live trees with heart rot for nesting and denning, medium-sized live trees to provide bird feeding perches, larger snags, favorable species composition, and diverse stand structures). These stands may be retained or may be treated to make them more resilient to fire and climate change. For example, timber harvest could occur within these stands to remove intermediate canopy trees and reduce ladder fuels or to reduce the basal area of remaining trees to make them more resistant to insect infestation and drought. Additional actions may include:
  - ♦ Retaining overstory trees and selectively thinning young understory trees in previously harvested stands that contain residual large trees. These may be past seedtree or shelterwood cuts.
  - Long-term retention of live leave trees within new harvest units, as well as in salvage units in burn areas. These may be healthy immature or mature trees with good growth rates, with good potential to achieve larger size classes over shorter time periods. They may be large trees with heartrot fungi, wounds, or broken tops that predispose them to dying in the future.
  - Retention of snags, especially large snags, both soft and hard, arranged as solitary trees or in small clumps. In areas that are lacking the minimum number of snags specified in the guidelines,

techniques to create nesting and denning habitat can be used such as girdling or topping, and/or artificial structures such as nest boxes/platforms may be installed.

- Leaving the largest live, diseased, or dead trees available in timber harvest units, to meet the needs of a larger number of wildlife species.
- Using modified thinning prescriptions in young stands of seedling/sapling or small tree sizes where species composition and stand structure are favorable for relatively rapid development of desirable future old growth structures. Treatment of the forest at the early successional stages can greatly influence composition, size, and other structural characteristics of the future forest. At the least, early treatments widen future options for managers to achieve desired ecological, social and economic outcomes for that stand
- Using prescribed fire, harvest, and/or thinning to create a small-patch mosaics of grassy openings, shrubs, dense patches of saplings, very large live trees, and large snags to address the maintenance or development of old growth forest or habitat, to restore historic stand structure, and to improve habitat for associated wildlife species within ponderosa pine stands. Snags could be arranged singly, as well as in clumps, to provide habitat for species such as flammulated owls, mountain bluebirds, pygmy nuthatches, and Williamson's sapsuckers.
- Protecting trees that have been retained in harvest units by using "wildlife tree" signs and/or clearing fuels beneath leave trees, if units would have slash treatment with prescribed fire.
- Clearing vegetation around the base of "legacy trees" (e.g., large, old western larch or ponderosa pine trees exceeding 25 inches d.b.h.) increases a legacy tree's resilience to climate change, fire and other disturbances.

#### Snags and downed wood

#### Desired condition FW-DC-TE&V-16, 17, 18 – key points

On lands suitable for timber production and within the wildland-urban interface, it is recognized that snag and down wood presence is generally more dependent on human actions than on natural disturbances. Expectations are for lower overall snag/down wood densities in these areas than in areas unsuitable for timber production or outside the wildland-urban interface, with greater emphasis on larger diameter material of desired species, to provide for desired distribution of important wildlife habitat. Of particular importance is the warm moist and warm dry settings, which are disproportionately located in wildland-urban interfaces and within lands suitable for timber production.

Additionally it is important to recognize opportunities to develop future snag habitat, of desired species and large sizes, by managing forests in the present to achieve desired composition, tree sizes, and forest densities.

#### Standards and guidelines (FW-STD-TE&V-05, 10)

Site-specific analysis may occur at the project level that supports an alternative prescription for snags or downed wood. The following factors may be considered in development of alternative prescriptions:

 Analyzing snag habitat at the broader scale than the harvest unit, and evaluating existing distribution, abundance, location and characteristics of snags within the larger landscape and/or project area, relative to snag availability and retention needs within harvest units.

• Recognizes snags (and downed wood) are unevenly distributed/clumpy at the landscape scale, and snag characteristics also highly variable across the landscape.

- Consider the proportion of area influenced by harvest activities relative to the proportion of area influenced primarily by natural disturbances.
- ♦ Consider current disturbances within the project area or across the broader landscape that may be providing abundant snags of desired characteristics, either in the short term (i.e., fire) or longer term (i.e., root disease, dwarf mistletoe). This may result in more focus on retaining live trees to meet future snag needs and leaving high stumps to provide wildlife feeding habitat.
- Consider snag characteristics (species, size, condition) within harvest units relative to availability of these characteristics across the landscape.
- Consider achievement of snag retention standards across all units, rather than each unit individually. This approach allows for incorporating and retaining the naturally clumpy distribution of snags, leaving greater numbers of higher quality snags where they exist.
- Considering the long and short-term perspective: Snags are a relatively short-term component (most become downed wood within a few years or decades).
  - Consider role of live trees in the present that contribute in the far future to desired snag habitat (composition, size), especially in the event of natural disturbance, such as fire.
  - Promote larger trees of fire resistant species to meet multiple forest plan desired conditions, including future desirable snag/downed wood habitat (e.g., western larch, ponderosa pine, Douglas-fir, western white pine).
- Considering cone collection needs with creation of desired decayed trees/snag habitat. For example, retention of select western larch trees within units, anticipating that they may be topped for purposes of collecting cones, which may also create desirable snag habitat.
- Considering other resource desired conditions or associated plan components (social, economic) that may influence stand or landscape-level snag prescription including a desire to reduce fuels to lower probability of high severity fire (in the wildland-urban interface). Lower densities of smaller snags (i.e., <15 inch d.b.h.) and lower amounts of downed woody material may be determined an appropriate prescription for portions of the wildland-urban interface. Larger diameter snags and downed woody material may be determined appropriate to retain, due to their relatively low contribution to fire hazard levels and their desirable contribution to soil function and wildlife habitat needs.</p>

## Forest pattern, patch sizes

Analyses of the natural range of variation indicates wide ranges in size of early successional seedling/sapling forest patch sizes, which would be expected considering the predominance of moderate and high severity fire disturbance regimes (refer to the environmental impact statement planning record exhibits for details on this analysis). The proposed action includes components that address desired forest patterns and patch sizes, particularly related to early successional seedling/sapling dominated openings across the landscape to (FW-DC-TE&V-19).

Character of forest patches and patterns related to early successional forest openings changes relatively rapidly compared to mid and later successional forest conditions. This is because seedling/sapling stands transition relatively quickly into mid-successional stands, with larger trees and dense forest canopies. This may occur 30 to 40 years after the disturbance that established the new forest. Stands can remain in this mid-successional, closed canopy, densely forested condition for many decades, or centuries if not altered

by stand replacing disturbance. Both fire (prescribed and wildfire) and timber harvest can be possible management tools for maintaining and creating desired amount and distribution of young, early successional forest patches.

# Application of the standard specifying maximum opening size for timber harvest (FW-STD-TIMB-07)

#### **Background** information

The National Forest Management Act (NFMA) is the foundation for this standard. The National Forest Management Act limits clearcutting and other even-aged harvest to situations where: "(iv) there are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal." (16 United States Code 1604(g)(3)(F)).

The 2012 planning rule (36 CFR part 219) and the associated guidance provided in Forest Service Handbook 1909.12, chapter 60, provide direction for the development of plan components related to timber production to ensure consistency with the Act. This direction includes specific requirements for development of plan components associated with size of created openings (Forest Service Handbook 1909.12, section 64.21).

The 2012 planning rule states that the plan, "must include standards limiting the maximum size for openings that may be cut in one harvest operation according to geographic areas, forest types or other suitable classifications," and within the forest types of the Flathead National Forest, this limit may not exceed 40 acres (36 CFR 219.11(d)(4)). This is the opening size limit under the 1986 Flathead Forest Plan. The 2012 planning rule provides for development of components that exceed opening size limits, where "larger harvest openings are necessary to help achieve desired ecological conditions" (36 CFR 219.11(d)(4)(i))." In addition, the 2012 rule (and the National Forest Management Act) provides for openings that exceed maximum limits in cases of "natural catastrophic conditions, such as fire, insect and disease attack, or windstorm" (36 CFR 219.11(d)(4)).

The standard FW-STD-TIMB-07 refers to the 40-acre maximum size that is stated in the 2012 planning rule and the Act and provides the new maximum opening sizes, consistent with the exceptions to the regulations, as also stated in the 2012 rule. This standard includes the particular conditions under which the larger size is permitted, including the desired conditions that the exception intends to achieve, as required by the 2012 rule. Openings up to this new maximum size do not need public review and Regional Office approval, as per the 2012 planning rule.

For development of the revised Flathead forest plan, analysis of natural range of variability in early successional forest conditions (e.g., openings) was conducted. Comparison to current size of openings was also done. This information was integrated with other resource and social considerations to derive the desired conditions for early successional forest openings, and the standard specifying maximum opening sizes for timber harvest. These considerations included the following:

Warm dry and warm moist biophysical settings: Maximum opening size is placed at the lower end of
the estimated natural range of variation, in consideration of where the majority of these sites are
located, e.g., lower elevations, intermingled ownership, nearer to homes/communities, higher road
concentrations, more easily accessible, big game winter range (warm dry).

• Cool moist-mod dry and cold biophysical setting: Maximum opening size is placed at lower end of the estimated natural range of variation. Current mean opening size is near the estimated natural range of variation mean due to recent fires. Most of the cool moist-mod dry setting is located in areas unsuitable for timber production and wildfire and prescribed fire is likely to play a dominant role in the future for creating large openings, rather than harvest. Essentially all of the cold biophysical setting is unsuitable for timber production, and wildfire/prescribed fire is expected to dominate in this setting.

#### **Potential strategies**

These strategies apply during project-level analysis, at both the landscape and stand level, to trend toward or maintain desired conditions for forest patterns and patch sizes and associated forest conditions (FW-DC-TE&V-03, 04, 19, FW-DC-ECOS TIMB-06)

- Trend towards creation of larger opening sizes across landscapes where analysis has indicated that the size and/or pattern of openings in not consistent with desired patterns or vegetation/habitat conditions. Larger openings have less edge per unit area, which is desirable for wildlife species that avoid edge habitats or experience greater mortality near edge habitats. Management strategies to create larger patch sizes across the landscape may include the following:
  - Retaining additional forest structural components within larger regeneration harvest areas to provide greater short and long-term structural diversity and provide a more visually pleasing landscape. This strategy could include leaving patches of uncut forest or individual/small groups of live trees distributed throughout the harvest openings and also may include retaining greater numbers of snags.
  - ♦ Considering scenery in project design (FW-GDL-SCN-03). To lessen the visual impact, larger harvest openings can have irregular shapes that are blended to the natural terrain. Retention of individual or patches of trees within the opening would also create a more visually pleasing appearance. Consideration for the natural patterns that might be produced by a mixed severity fire may be incorporated into the shape and size and design of openings. In this case, there would be an expectation of short-term visual impacts to achieve long-term benefits may be understood.
  - ♦ Locating new harvest openings immediately adjacent to existing patches of sapling size trees. This initially creates a larger patch of early successional forest, where trees are of the same cohort (i.e., ages are within 20 years of each other), while lessening potential concerns related to larger openings.
  - Considering the location of larger units. When determining where a larger opening might be created, consider factors such as: wildlife security (e.g., adjacency to open roads or viewpoints); visibility from areas with high level of public use; desired conditions related to potential fire behavior and fuel loadings; watershed conditions related to water yields; big game winter range desired conditions.
  - ◆ Considering desired conditions for development of future late successional and old growth forests. Larger patches of young, seedling/sapling forests can eventually develop into larger patches of old growth or late successional forest over time, which is a desired long term condition for the ecosystem (FW-DC-TE&V-15 and FW-DC-GDL-07).

#### Managing forest pattern to provide wildlife habitat connectivity

Because cover providing wildlife habitat connectivity changes due to a variety of processes (e.g., wildfire, insects, disease, timber harvest, prescribed fire), it is best assessed for vegetation management projects on

a site-specific basis—at a stand scale and at a 6<sup>th</sup> code hydrologic unit code (HUC) watershed scale. Site-specific analysis of forested connectivity looks at connections provided by and between areas of forests to maintain connectivity for wildlife species associated with forest interior conditions. An example of a method to accomplish this strategy would be to retain patches of trees with an average d.b.h. of at least 5 inches, which are shaped so that a portion of the patch is more than 325 feet from the edge (of a stand with an average d.b.h. of less than 5 inches). This location can be determined by taking the forest patch that is greater than 5 inches average d.b.h. and using the geographic information system (GIS) spatial buffer analysis tool to create an interior buffer of 325 feet while also paying special attention to providing forested connections in RMZs, in saddles along ridgelines, and also between old growth forest patches.

An example of a project analysis using this strategy is displayed in figure C-1 (A. Jacobs, USFS Wildlife Biologist). In this example, harvest units are designed so that green and brown patches (cover) are maintained that are at least 650 feet wide in between patches of yellow (not cover). In addition, special consideration is given to retaining late successional forest (dark green) between and adjacent to patches of brown (old growth) to increase the size of patches that have old growth habitat characteristics and to maintain its connectivity.

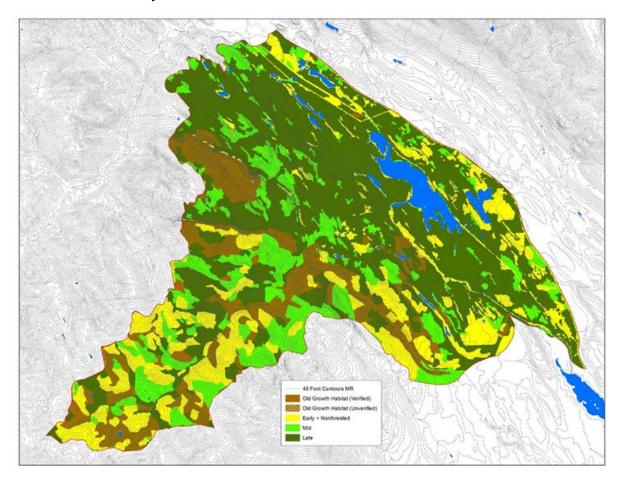


Figure C-1. Example of habitat connectivity analysis

In another example, for projects planned in portions of the Salish Mountains or Swan Valley geographic areas where sections under other land ownerships have been regenerated, unit location and treatment prescriptions could consider the long-term desired condition to create more "natural" forest patterns,

patch sizes, and shapes across the landscape, reducing the "checkerboard" pattern. A way to accomplish this strategy would be to create new, irregular shaped harvest openings adjacent to existing seedling/sapling stands that have a straight edge, to make the total opening blend in with the surrounding landscape.

Other wildlife connectivity considerations include the following:

- Coordinating with other agencies or landowners to identify practices that facilitate wildlife movement and reduce mortality, when highway or forest highway construction or reconstruction is proposed in linkage areas, as well as using the best available scientific information (e.g., Highway Mitigation for Wildlife in Northwest Montana<sup>35</sup>).
- Emphasizing key habitats such as riparian areas, to maintain connectivity across all lands.<sup>36</sup>
- Protecting and restoring ecological connectivity as a leading climate adaptation strategy for biodiversity. Conservation and riparian areas have been identified as key targets for these efforts.<sup>37</sup>

#### **Burned forests**

This section provides strategies for FW-DC-TE&V-24 and use of fire to maintain or increase forest diversity and resilience. Management area discussions and the "Fire" section of the proposed plan also provide direction on the desired role of wildfire as well as wildfire suppression.

- Assessment of salvage harvest in burned forests is best considered in a landscape context. In many
  areas of the forest, stand-replacing wildfires may kill trees over thousands of acres. Evaluating the
  entire area within the burn perimeter to determine the percentage of each management area contained
  within it provides important information. For example, if a large percentage of the wildfire area is
  within management areas that would not be accessed for salvage harvest, then more salvage harvest
  may be considered within management areas that are accessible.
- When wildfires occur, site-specific analysis can be used to address desired conditions to salvage dead trees for economic value, for future fire behavior, for social considerations such as spread of insects to adjacent private lands, and for desired ecological conditions.
- Several wildlife species are associated with burned forests. Black-backed woodpeckers are closely associated with intensively burned areas that have at least 50 percent canopy closure prior to wildfire. Following wildfire, use of burned areas by black-backed woodpeckers changes over time and they move from areas where trees have died immediately after fire, to areas where trees die slowly after fire, to unburned areas. The following example strategies benefit black-backed woodpeckers and could be used when considering post-fire salvage harvest of wildfire areas:

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<sup>&</sup>lt;sup>35</sup> Ament R., P. McGowen and M. McClure. 2014. Highway Mitigation for Wildlife in Northwest Montana. National Fish and Wildlife Foundation. http://largelandscapes.org/media/publications/Highway-Mitigation-Wildlife-NW-Montana.pdf.

<sup>&</sup>lt;sup>36</sup> Haber, J. and P. Nelson. 2015. Planning for Connectivity, A guide to connecting and conserving wildlife within and beyond America's national forests. Ament, R., G. Costello, W. Francis and M. Salvo (contributors). The Center for Large Landscape Conservation, Defenders of Wildlife, Wildlands Network and Yellowstone to Yukon Conservation Initiative. 26 pp. <a href="http://www.defenders.org/publication/planning-connectivity">http://www.defenders.org/publication/planning-connectivity</a>

<sup>&</sup>lt;sup>37</sup> Krosby, M., R. Norheim and D.M. Theobald. 2015. Riparian Climate-Corridors: Analysis Extension, Improvements, and Validation. Climate Impacts Group, University of Washington, Seattle. https://cig.uw.edu/publications/riparian-climate-corridors-analysis-extension-improvements-and-validation/

• For new fires that burn more than 250 acres at moderate to high severity, retain a range of snag species preferably with a minimum d.b.h. greater than 9 inches d.b.h. for nesting.

- Retain clumps of burned trees, including both nest trees and trees with high densities of woodboring beetles for feeding, because food sources near nest trees appear to be limiting to blackbacked woodpecker populations. In burn areas greater than 1000 acres in size, consider retaining larger patches at least 100 acres in size.
- Retain snags in the interior of the fire area, if possible, and where snags would not be susceptible to loss due to firewood cutting.
- In addition to dead trees, retain live trees that are scorched because they die over a longer period of time, helping to maintain higher populations of black-backed woodpeckers.
- Recognize the value of different snag tree species for wildlife:
  - ♦ Douglas-fir high value feeding habitat, short longevity (i.e., lower value as nesting habitat)
  - ♦ Ponderosa pine high value feeding habitat; value for nesting, though shorter longevity than western larch (especially important for flammulated owl habitat)
  - Western larch and western red cedar high value for feeding and nesting, highest longevity. Case-hardened western larch snags are valuable for perching (flycatchers) and drumming (woodpeckers) and may last many decades, though they may not provide nesting habitat unless they eventually get some interior rot
  - ♦ Cottonwood, birch and aspen high value nesting and feeding, even when small diameter, rot and tops break out but still of high value; high value for denning.
  - ♦ Lodgepole pine high value for feeding
  - ◆ Englemann Spruce short longevity, high value for feeding, large rootwads and boles high value for denning.

#### Non-coniferous plant communities

Potential strategies for FW-DC-TE&V-10 to maintain or increase the presence of hardwood trees and FW-OBJ-TE&V-03 for vegetation management treatments on 500 to 5,000 acres of forest to contribute to restoration of diverse native hardwood forest types:

Retaining hardwood trees to the degree possible within harvest units

Removing understory conifers in aspen or cottonwood plant communities, through cutting or understory trees or use of prescribed fire

- Root-cutting, burning, or cutting of hardwood trees less than 10 inches diameter breast height (d.b.h.) to promote suckering
- Allowing beavers to flood areas to maintain and regenerate hardwoods and other riparian areas.
- Planting hardwood seedlings and/or stems.
- Retaining vegetation adjacent to large cottonwood trees if needed to help prevent blowdown.
- Retaining cottonwood trees in largest size classes to provide nest sites for species such as Pileated woodpeckers or great blue herons and provide den sites for fishers and black bears.

Potential strategies for FW-OBJ-TE&V-04. Vegetation management treatments on 1,500 to 5,000 acres to promote persistence of grass/forb/shrub plant communities, focusing on key habitats for big game species to improve conditions for native plant establishment and growth and reduce non-native plants. Possible actions in cooperation with Montana Fish, Wildlife and Parks; counties, and non-government organizations, include the following:

- Slashing and/or managing fire (i.e., prescribed fire and wildfire) to maintain or create grass/forb/shrub openings and stimulate shrub sprouting
- Revegetating disturbed sites with native grass/forb/shrub species
- Treating invasive weeds, with biological, chemical, or mechanical means, as appropriate.

# Threatened species, endangered species, and species of conservation concern associated with terrestrial habitats

The following subsections provide possible strategies for plant and wildlife species in this category (also see strategies identified under the Terrestrial Ecosystem and Vegetation Management, Fire Management, Watershed, Riparian Habitat, and Aquatic Species sections of this appendix).

#### **Plants**

#### Water howellia

Direction within the conservation strategy (second edition<sup>38</sup>) guides management actions related to *Howellia aquatillis* on NFS lands. This direction is necessary to ensure the long-term persistence of water howellia, and would be updated as needed with new information as available.

#### Whitebark pine

Whitebark pine habitat is present in most of the recommended wilderness areas, and is considered a key ecological component in these areas, providing an important contribution to sustaining the wilderness quality and character. This contribution includes habitat for wildlife species, scenic character, forest ecological resilience and health, maintenance of naturalness and natural processes, and trending forests towards natural range of variability for forest composition and structure.

The revised forest plan explicitly allows for implementation of restoration activities associated with whitebark pine and other ecological conditions so long as "the social and ecological characteristics that provide the basis for wilderness designation are maintained and protected." The intent is to continue to allow for such activities as prescribed burning, planting and thinning of whitebark pine, insect and disease protection measures, fuel reduction around cone-collection trees, caging cones, and collection of seed and scion within recommended wilderness areas.

Site-specific environmental assessment and analysis is needed prior to applying activities related to restoration of whitebark pine. The publication, "A Range-Wide Restoration Strategy for Whitebark Pine" includes considerations when proposing restoration activities within recommended wilderness

<sup>&</sup>lt;sup>38</sup> USDA. 1997. Conservation strategy for *Howellia aquatilis* A. Gray, second edition, USDA, Northern Region, Flathead National Forest. 24 pp.

<sup>&</sup>lt;sup>39</sup> Ibid

areas because of the need to maintain and protect the social and ecological characteristics providing the basis for wilderness designation. To provide additional support and documentation for restoration activities it is recommended that a white paper be developed that consolidates known information on whitebark pine specific to the Flathead National Forest. This paper may include information on:

- Conditions of whitebark pine on the Flathead National Forest, why it is in its current condition (human-caused introduction of exotic disease), ecological consequences
- Documentation of inventories, research, studies, professional and local knowledge, and publications or other information that supports the importance of restoration efforts for local populations
- Flathead National Forest whitebark pine restoration program goals, objectives, methods, strategies and priorities
- Present and future needs, expectations, and uncertainties.

#### Wildlife

#### Canada lynx habitat and/or critical habitat

This section provides possible strategies for FW-DC-TE&V-08, FW-DC-TE&V-19, FW-DC-WL-03, Appendix F VEG O2, O4, and S5.

The physical and biological conditions providing for Canada lynx and their critical habitat changes over time as a result of fire, forest succession, timber harvest and other vegetation management techniques that create a mosaic of structural stages and species compositions.

In modelled Canada lynx habitat, and outside the wildland-urban interface, the desired condition for each lynx analysis unit is to have interconnected areas of mature multi-story forests with Engelmann spruce and subalpine fir trees exceeding 1,000 stems per acre in the understory (less than 4 inches d.b.h.) and 280 stems per acre in the mid-story and overstory (greater than 4 inches d.b.h.) (Squires 2010). Young forests with extremely high densities (e.g., greater than 14,000 stems per acre) occur following wildfires, but are interspersed in a mosaic with stands of much lower densities that are developing a multi-storied stand structure. Down trees provide sites for denning. Branches of live trees and shrubs touch the snow surface in winter to provide food and cover for snowshoe hares. Where conditions allow, a habitat mosaic including long, linear patches of interconnected mature forest adjacent to dense young forests is desirable. Treatments are determined by site-specific analysis of potential vegetation types and current vegetation conditions at the stand and lynx analysis unit scales, in the context of the forest scale detailed in the DEIS.

At any given point in time, some forested stands in lynx habitat provide lynx habitat in a suitable condition and some would not. Lynx habitat may be in a temporarily unsuitable condition due to processes such as wildfire, insects or disease infestation, timber harvest, thinning, or prescribed burning. Timber harvest and prescribed burning may be used to create lynx habitat in a suitable condition in areas that currently do not have dense understory conditions, for example:

• Timber harvest methods may include regeneration harvest, group selection or intermediate harvest methods in the stem exclusion structural stage or in other forested stands that currently do not have a dense understory providing snowshoe hare habitat. Prescriptions may be designed to favor dense regrowth of coniferous tree and shrub species that provide food for snowshoe hares (table C-4).

Table C-4. Food plants used by snowshoe hares in the Western Rockies, Cascades and Intermountain West (source: table 2.1 Lynx Biology Team 2013)

Conifers	Shrubs	References
Abies lasiocarpa	Amelanchier alnifolia	Adams 1959 (MT)
Abies grandis	Arctostaphylus uva-ursi	Koehler 1990a (WA)
Larix occidentalis	Ceanothus spp.	Radwan & Campbell 1968 (WA)
Picea engelmannii	Juniperus scopulorum	Thomas et al. 1997 (WA)
Pinus contorta	Mahonia repens	Sullivan and Sullivan 1983 (BC)
Pinus monticola	Paxistima myrsinites	Borrecco 1976 (WA)
	Pteridium aquilinum	Black 1965 (OR)
Pinus ponderosa	Rosa spp.	Wirsing and Murray 2002 (ID)
Pseudotsuga menziesii	Rubus spp.	Zahratka 2004 (CO)
Thuja plicata	Salix coulteri	Zimmer 2004 (MT)
Tsuga heterophylla	Shehperdia canadensis	Ellsworth and Reynolds 2006
	Spirea betulifolia	
	Symphoricarpus albus	
	Vaccinium spp.	

• Salvage harvest may be conducted in areas that do not have a dense live understory providing snowshoe hare habitat (e.g. stands of mature lodgepole pine trees that are killed by mountain pine beetle or stands where trees have been killed by stand-replacing wildfire).

Monitoring of areas recently burned by wildfire on the forest indicates that a continued adaptive management strategy may be desirable to promote lynx habitat conditions that are more sustainable in the face of expected future climates. If supported by the best available scientific information, and if approved by the regional level of the Forest Service and State level of the USFWS, the following strategies may be used:

- In some forested stands within lynx habitat that have been recently harvested or burned, precommercial thinning using modified methods may occur to promote development of future mature multi-storied winter snowshoe hare habitat in lynx analysis units where it is lacking, where stands that have regenerated from wildfire consist of extremely dense (14,000–50,000 stems per acre) lodgepole pine or western larch, or where there is an abundance of early stand initiation forest resulting from large areas burning at one time. The location, amount and type of precommercial thinning would be based upon an analysis of vegetation conditions at the lynx analysis unit scale, guided by the best available scientific information, and finalized through appropriate consultation.
- In dense lodgepole pine stands, techniques studied by Bull and others <sup>40</sup> may be used. Bull and others evaluated a variety of precommercial thinning techniques using telemetry locations from 87 snowshoe hares within lodgepole pine stands located in northeast Oregon. Treatments studied included stands thinned 4–10 years ago using traditional, even tree spacing (14 x 14 ft); stands thinned 20–25 years ago using traditional, even tree spacing (10 x 10 ft), and two alternative thinning methods where strips or patches of trees were thinned in a surrounding matrix of unthinned trees. Similar to other researchers, Bull found that forests recently thinned using traditional techniques

<sup>&</sup>lt;sup>40</sup> Bull, E.L., T.W. Heater, A.A. Clark, J.F. Shepherd and A.K. Blumton. 2005. Influence of precommercial thinning on snowshoe hares. Research Paper PNW-562. USDA, Forest Service. Pacific Northwest Research Station. Portland, Oregon, 16 pp.

resulted in the lowest use by hares. The highest hare use of the five treatments was a technique Bull called "patch cuts," where small circular patches (10 meter, or 33 feet) of trees were thinned within a larger area of unthinned forest (at least 33–165 feet wide). This design is shown in figure C-2. Bull stated, "Of the thinning treatments, the highest numbers of trapped hares and the smallest home ranges occurred in the patch cuts (which had higher use than the unthinned forest control), whereas traditional methods of precommercial thinning lodgepole pine (recent thinning and old thinning) resulted in lowest numbers of snowshoe hares. In the short term, the patch cut appeared to provide the best habitat of those treatments investigated. The hare numbers that we found in patch cuts are characteristic of peak densities found in southern montane forests (1 to 2 hares/ha: Hodges 2000a In Bull and others<sup>41</sup>), and hare densities found in the other treatments were lower than these. Home ranges reported in this study were similar to the 12.4–28.8 acre home range size reported by numerous studies reviewed by Hodges (2000b *In* Bull and others<sup>42</sup>). The two new thinning regimes (patch and corridor cuts) were developed specifically to improve habitat for hares as compared to traditional thinning treatments, and we are not aware of these treatments being used elsewhere." Bull also found that cover provided by vegetation and coarse woody debris within 1 meter (3.3 ft) of the ground appeared to be important for hares, particularly in summer. Slash from the patch and corridor cuts provided both forage and dense hiding cover for a year after treatment. Coarse woody debris provided hiding cover at more than half the rest sites in summer, and created subnivean habitat at many of the rest sites in winter.

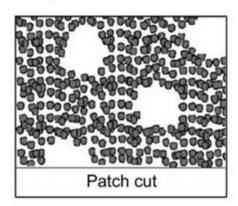


Figure C-2. Diagram of Bull's patch thinning technique

• The Flathead Forest may use other modified precommercial thinning techniques in areas where early stand initiation forests are abundant due to stand-replacing wildfire. The Forest has monitored these techniques and modelled changes in forest structure over long periods of time using the Forest Vegetation Simulator, which uses statistically reliable stand data collected in the field. The Forest simulated effects of "traditional" thinning techniques and "modified" techniques, where stands were thinned with the intent of specifically improving forest composition and structure to provide the kind of mature habitat hares and lynx need over the over the long-term. Figure C-3 and figure C-4 show simulated changes in structure and composition over time.

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<sup>&</sup>lt;sup>41</sup> Bull, E.L., T.W. Heater, A.A. Clark, J.F. Shepherd and A.K. Blumton. 2005. Influence of precommercial thinning on snowshoe hares, Research Paper PNW-562, USDA, Forest Service, Pacific Northwest Research Station. Portland, Oregon. 16 pp.

<sup>&</sup>lt;sup>42</sup> Ibid.

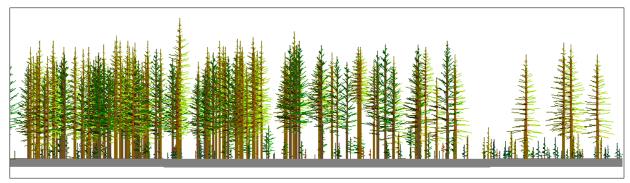


Figure C-3. Traditional thinning 20 years after harvest – 30 years later. All trees thinned to an average of 300 trees per acre—dense understory providing hare habitat lacking

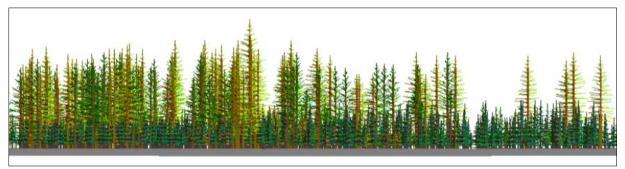


Figure C-4. Same forest stand as shown in the previous figure with modified precommercial thinning: 20 years after harvest – 30 years later. Western larch and Douglas fir canopy thinned to an average of 300 trees per acre, but smaller spruce and fir in the understory not thinned –dense understory providing hare habitat present

Vegetation management strategies could be used to promote future mature multi-story hare habitat, to increase resilience to anticipated future climates, and to meet desired conditions with respect to fire behavior so that infrastructure and existing areas of mature multi-story hare habitat may be protected. Methods to create mature multi-story hare habitat include modified thinning techniques in young (seedling/sapling) stands, which change the future forest structure and composition in ways that create winter snowshoe hare and lynx habitat (using appendix F, VEGS5 exception #1 and/or exception #3). Two examples of these modified thinning techniques follow:

• One example of a modified precommercial thinning prescription may occur in coniferous forest stands in the stand initiation structural stage, where there is Engelmann spruce and sub-alpine fir mixed with western larch and/or Douglas-fir. The taller trees (typically shade-intolerant species, such as western larch or Douglas-fir) may be thinned to a relatively wide spacing (i.e., 15 feet or more average spacing) and the shorter trees (typically shade-tolerant species, such as subalpine fir and Engelmann spruce) left unthinned. One way to implement this prescription is to require all trees below a certain height, such as 6 feet, to be retained, while thinning only the tree layer that is over 6 feet tall. This thinning method increases the growing space and sunlight received by all trees in the stand, allowing the subalpine fir and spruce to establish and flourish in lower canopy tree layers, while also developing an upper canopy of western larch and/or Douglas-fir with improved growth and vigor. This method promotes development of the stand into a mature multi-storied forest that can provide winter snowshoe hare and lynx habitat in the long-term. Field examinations of forest stands that were thinned using this method in the 1980s have shown that these stands developed a multi-storied stand structure in a shorter time frame than they would have without thinning. Lynx telemetry

data on the Flathead Forest shows that stands thinned in the 1980s are being used by Canada lynx in winter. Because western larch and Douglas-fir are adapted to surviving fire, if they reach a large enough size between wildfires (and sub-alpine fir or Engelmann spruce are not adapted to surviving fire), this strategy could be used to help maintain greater structural and species diversity over time, even if wildfires become more frequent. If species such as western larch are able to grow to large sizes and survive repeated fires, they can provide key habitat for a wide variety of bird species.

#### Grizzly bear habitat

This section provides strategies that apply to the primary conservation area for grizzly bears and are relevant to FW-DC-TE&V-01; FW-DC-TE&V-02; FW-DC-TE&V-04; FW-DC-TE&V-11; FW-DC-WL-01; FW-GDL-TE&V-02;

- Vegetation and fuels management activities may need to be restricted in time and space to reduce the potential for adverse disturbance or displacement of grizzly bears, as determined by an environmental analysis. For example, activities along main open roads may not disturb or displace grizzly bears because grizzlies may already be habituated to high levels of human activity in these areas. However, where grizzly bears are not used to high levels of human activity, activities could be completed during the denning period. If it is not feasible to complete activities during the denning time period, operations may be restricted in time and space to reduce significant disruptions of normal or expected grizzly activities. For example, logging is often restricted during the spring to favor the needs of grizzly bears during a key time period, when snow at upper elevations reduces availability of foraging habitat (typically April-June, but this varies due to elevation and snow melt conditions). In summer, when abundant habitat is available to grizzlies, operations such as timber harvest may not be restricted, but are subject to standards for temporary increases in motorized access due to projects (also see glossary). Other forest management activities such as precommercial thinning, burning, weed spraying, and road best management practices may need to be completed during the spring time period in order to meet objectives (especially if needed to prevent resource damage), but should otherwise be restricted in time or space. For example, springtime activities could be limited to only one portion of a bear management subunit, before moving to the next portion.
- Silvicultural treatments in forested cover can provide a mosaic of all successional stages over the long term, with a variety of stand structures and species compositions. Group selection cuts and irregularly shaped regeneration harvests, in which prescribed fire slash removal is used to mimic wildfire, are desirable for creating high grizzly food producing openings in some stand types and habitat types. In appropriate locations and habitat types, vegetation management activities can increase light available for berry-producing shrubs that bears use for food, increasing their berry production (also see the Special Forest Products strategy section in this appendix). Examples of berry-producing shrubs include, but are not limited to, huckleberries (*Vaccinium globulare, Vaccinium membranaceum*), serviceberries (*Amalanchier alnifolia*), mountain ash (*Sorbus scopulina*), and buffaloberry (*Shepherdia Canadensis*). Grizzly bear habitat enhancement through vegetation management is not recommended in or next to campgrounds and other developed sites frequented by people, because this may increase the risk of grizzly bear-human conflicts.
- Where there is an intent to promote growth of grizzly bear foods, desirable regeneration harvest and slash disposal methods may include options such as yarding methods designed to minimize soil disturbance, minimize weed invasion, and promote bear foods, where appropriate. Desirable regeneration harvest and slash disposal includes options such as:

 Methods to minimize the distance to cover such as oblong or irregularly shaped harvest units or retention of one or more leave patches in units larger than 10 acres that would not be broadcast burned

- Minimum soil scarification in habitat types where soil disturbance impedes the reestablishment of grizzly foods (consistent with management plans)
- ♦ Slash disposal by broadcast burning or whole-tree yarding to maintain or improve foods for grizzly bear in suitable habitat types and terrain
- Protection of hydric stream bottoms, wet meadows, marshes, and bogs from soil disturbance and excessive cover removal Sale Area Improvement Timber sale receipts, collected for post-sale area improvement (e.g., Knudsen-Vandenberg Act and other funds collected under stewardship contract projects) may be used, when practical, to enhance or restore the grizzly habitat quality of a logged area if it occurs in a desirable location, described above.
- Timber harvest unit layout may be designed to maintain cover along meadows and other open feeding sites, riparian areas, past harvest units that do not yet provide hiding cover, or known travel corridors as specified in an environmental assessment. Sometimes cover is maintained by natural topography or sometimes un-thinned strips or patches need to be retained within or adjacent to harvest units and precommercial thinning units if needed (e.g., to provide screening adjacent to open roads).
- If new trails are constructed or reconstructed in back-country areas where mountain bike use or motorized trail use is allowed, Montana Fish, Wildlife and Parks suggests the following considerations to reduce the risk of grizzly bear-human conflicts:
  - Using designs that facilitate maximum sight distance
  - Not incorporating banked corners that encourage mountain bikes or motorized trial bikes to corner at high speeds

As stated in FW-STD-IFS-03, in each bear management subunit within the NCDE PCA, temporary changes in the open motorized route density, total motorized route density and secure core shall be calculated for projects (as defined by "project (in grizzly bear habitat in the NCDE)" in the glossary).

The 10-year running average for open motorized route density, total motorized route density, and secure core numeric parameters shall not exceed the following limits per bear management subunit:

- 5 percent temporary increase in open motorized route density in each subunit (i.e., open motorized route density baseline plus 5 percent);
- 3 percent temporary increase in total motorized route density in each subunit (i.e., total motorized route density baseline plus 3 percent);
- 2 percent temporary decrease in secure core in each subunit (i.e., secure core baseline minus 2 percent).

Standard FW-STD-IFS-03 must be met, but has some project-specific flexibility in how it is met. Table C-5 and table C-6 show two examples of how temporary changes in open motorized route density, total motorized route density, and secure core could be implemented for a project.

#### Temporary increase for projects - hypothetical example #1

Example in table C-5: According to standard FW-STD-IFS-03, the 10-year running average for open motorized route density is allowed to increase by 5 percent. In the table C-5 example, it increases from 19 to 31 percent (12 percent net) for four years, or a 10-year running average of 4.8 percent (48 percent

divided by 10), so the standard is met. The 10-year running average for total motorized route density is allowed to increase by 3 percent. In the table C-6 example, it increases from 19 to 22 percent (3 percent net) for four years, or a 10-year running average of 1.2 percent (12 percent divided by 10), so the standard is met. The 10-year average for secure core is allowed to decrease by 2 percent. In the table C-5 example, the net decrease in secure core is 5 percent per year for 4 years, or a 10-year running average of 2 percent (20 percent divided by 10), so the standard is met. In this hypothetical example of a 4-year project, the 10-year running average for core has reached the limit of 2 percent, so another project in this subunit would not be possible during the non-denning season, unless that project complied with administrative use levels for open motorized route density, total motorized route density, or secure core.

#### Temporary increase for projects - hypothetical example #2

Example in table C-6: Open motorized route density increases from 17 to 22 percent (5 percent net) for five years, or a 10-year running average of 2.5 percent (25 percent divided by 10), so the standard is met. In the table C-6 example, total motorized route density does not increase, so the standard is met. In the table C-6 example, the net decrease in secure core is 2 percent per year for 5 years, or a 10-year running average of 1 percent (10 percent divided by 10), so the standard is met. In this hypothetical example of a 5-year project, none of the 10-year running averages have reached their respective limits of 5, 3 or 2 percent.

Table C-5. Changes in values in a bear management subunit for open motorized route density, total motorized route density, and secure core for project in years 7 through 10

Variable	Baseline Value	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
OMRDa	19	19	19	19	19	19	19	31	31	31	31
TMRD⁵	19	19	19	19	19	19	19	22	22	22	22
Secure Core	68	68	68	68	68	68	68	63	63	63	63
Net change	_	0	0	0	0	0	0	+12% OMRD +3% TMRD -5% core			

a. Open motorized route density

Table C-6. Changes in values in a bear management subunit for open motorized route density, total motorized route density, and secure core for project in years 5 through 10

Variable	Baseline Value	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
OMRD <sup>a</sup>	17	17	17	17	17	17	22	22	22	22	22
TMRD⁵	18	18	18	18	18	18	18	18	18	18	18
Secure Core	60	60	60	60	60	60	58	58	58	58	58
Net change	_	0	0	0	0	0	+5% OMRD +0% TMRD -2% core				

a. Open motorized route density

b. Total motorized route density

b. Total motorized route density

#### Fisher (SCC)

To implement FW-DC-WL SCC-01 and FW-GDL-WL SCC-03: In northern Idaho and west-central Montana, Sauder and Rachlow found that habitat selection by fishers at the landscape scale was best modeled using characteristics of both forest configuration and composition. At the scale of 50–100 km² (12,355–24,710 acre) landscapes, fishers in northern Idaho and west-central Montana selected for home ranges with greater than 50 percent mature forest arranged in connected, complex shapes with few isolated patches, and open areas comprising less than 5 percent of the landscape. Jones and Garton that riparian areas make excellent corridors provided they are large enough to enable fishers to avoid predation.

On the Flathead National Forest, fisher habitat as modelled by Olson and others<sup>45</sup> was displayed in the Flathead National Forest Assessment. 46 In contrast to north and central Idaho, there are very few areas with 12,355–24,710 acres of modelled fisher habitat in contiguous blocks. Intermingled land ownership, climate, and a history of fire play a primary role in this pattern on the Flathead National Forest. The largest areas of potential fisher habitat are in the portion of the warm-moist biophysical setting composed of mixed species, including very large western red cedar, western hemlock, western larch, western white pine, Douglas-fir, and grand-fir. If new vegetation management projects are proposed in the warm-moist biophysical setting (excluding ponderosa pine stands) an area that is 12,355–24,710 acres in size would be analyzed to see if it provides at least 50 percent mature forest. Alternatives could be designed to maintain mature forest arranged in connected, complex shapes as described in the previous paragraph. Meeting the standards for old growth, very large live trees, very large dead trees, woody material and riparian management zones would provide key ecosystem characteristics needed by fisher. Maintaining inter-connected cover between patches of old growth and adjacent to old growth where needed to increase old growth patch size (as described in the section on "forest pattern-wildlife habitat connectivity") would also benefit fisher. Harvest of intermediate sized trees may be designed so that connections between patches are not severed. Young forests may be precommercially thinned, or mature forests may be commercially thinned, to create a small-patch mosaic and promote faster development of large trees (where it does not conflict with the needs of other species).

#### Flammulated owl (SCC)

Flammulated owls are associated with mature (>15 inch d.b.h.) and old-growth dry ponderosa pine/Douglas-fir stands and are absent from mesic ponderosa pine and Douglas-fir.<sup>47</sup> Management

<sup>&</sup>lt;sup>43</sup> Sauder, J.D. and J.L. Rachlow. 2014. Both forest composition and configuration influence landscape-scale habitat selection by fishers (*Pekania pennanti*) in mixed coniferous forests of the Northern Rocky Mountains. *Forest Ecology and Management*. pp. 75–84.

<sup>&</sup>lt;sup>44</sup> Jones, J.L. and E.O. Garton. 1994. Selection of successional stages by fisher in north central Idaho. S.W. Buskirk, A. Harestad, M. Raphael, R.A. Powell (eds.) *In*: Martens, Sables, and Fishers: Biology and Conservation, pp. 377–387. Ithaca, New York. Cornell University Press. p. 484.

<sup>&</sup>lt;sup>45</sup> Olson, L.E., J.D. Sauder, N.M. Albrecht, R.S. Vinkey, S.A. Cushman and M.K. Schwartz. 2014. Modeling the effects of dispersal and patch size on predicted fisher (*Pekania* [Martes] *pennanti*) distribution in the U.S. Rocky Mountains. *Biological Conservation* 169: 89–98.

<sup>&</sup>lt;sup>46</sup> USDA. 2014. Assessment of the Flathead National Forest, Part 1, Part 2, and Appendices A–E, USDA, Forest Service, Region 1. Flathead National Forest. April.

<sup>&</sup>lt;sup>47</sup> Wright, V., S.J. Hejl and R.L. Hutto. 1997. Conservation implications of a multi-scale study of Flammulated owl (*Otus flammeolus*) habitat use in the northern Rocky Mountains, USA. J.R. Duncan, D.H. Johnson, T.H. Nicholls (editors). Biology and conservation of owls of the Northern Hemisphere: 2nd International symposium,

strategies to implement FW-DC-WL SCC-01 and to benefit flammulated owls promote the following conditions: <sup>48, 49, 50</sup>

- Clusters (of at least two patches) of mature and old growth forest approximately 35 to 40 acres in size with moderate, but not dense, tree canopy cover ranging from 35-65 percent, to provide nesting habitat
- Mid to large sized snags with cavities excavated by the Pileated woodpecker, Northern flicker, or Sapsucker
- Mature forest interspersed with grassy openings and an open forest floor for feeding
- Mixed conifer patches or dense patches of small Douglas-fir for roosting within mature stands, in close proximity to snags providing potential nest sites.

Wright (1996) found that flammulated owls were not present unless the larger landscape consisted of low canopy cover ponderosa pine and Douglas-fir forests, and then only where grassland or xeric shrubland openings were present at a home range scale. Wright found that flammulated owls were less abundant in ponderosa pine/Douglas-fir landscapes that were heavily logged, but that partial harvesting with snag retention may create the structure that is more suitable.

#### Clark's nutcracker (SCC)

To implement FW-DC-WL SCC-01: See sections in this appendix on whitebark pine and ponderosa pine.

#### Possible strategies for the Townsend's big-eared bat and other bat species

Possible strategies that may be used to implement FW-DC-TE&V-05, FW-DC-WL SCC-01 and FW-GDL-WL SCC-01, 02 include the following:

- Working cooperatively with researchers and educational caving clubs to inventory caves for bats, to
  improve knowledge of baseline conditions, while limiting disturbance to bats by coordinating and
  combining, when possible, scientific and management activities involving access to subterranean bat
  roosts, especially while bats are likely to be present.
- Working with Montana Fish Wildlife and Parks and other cooperators to monitor aquatic and riparian habitats for bats using mist-netting and/or acoustic surveys.
- Monitoring and reducing the spread of white-nose syndrome. Various methods may be used, for
  example, monitoring through partnering with individuals and organizations that utilize subterranean
  bat roosts to best conserve underground environments and their fauna and flora. Educating visitors
  and local communities about both white-nose syndrome and bat, cave, and other subterranean habitat

February 5-9, 1997. Winnipeg, Manitoba, Canada. General Technical Report NC-190. USDA, Forest Service, North Central Forest Experiment Station. St. Paul, Minnesota. 632 pp.

C-43

<sup>&</sup>lt;sup>48</sup> Bull, E.L., A.L. Wright and M.G. Henjum. 1990. Nesting habitat of flammulated owls in Oregon. *Journal of Raptor Research*, 24: 52–55.

<sup>&</sup>lt;sup>49</sup> McCallum, D.A. 1994. Chapter 4: Review of technical knowledge: Flammulated owls, *In*:

Flammulated, Boreal, and Great Gray Owls in the United States: A Technical Conservation Assessment. General Technical Report RM-253, USDA, Forest Service. Rocky Mountain Forest and Range Experiment Station. Fort Collins, Colorado. p. 214.

<sup>&</sup>lt;sup>50</sup> Wright, V. 1996. Multi-Scale Analysis of Flammulated Owl Habitat Use: Owl Distribution, Habitat Management, and Conservation. Master's thesis. Department of Biological Sciences, University of Montana. Missoula, Montana.

conservation. Educating the public and cave inventory personnel about proper decontamination techniques to reduce the risk of white-nose syndrome in bats.

• Bat surveys are best conducted before old buildings or bridges are demolished and before old mines are closed. These structures can be evaluated for the presence of bat species prior to closure and mitigated as needed, based upon the site-specific analysis.

## All wildlife species

Potential strategies or approaches that may be used in the management of wildlife include the following:

- Cooperating in interagency, non-government organizations, and citizen science survey efforts for species associated with alpine-subalpine habitats (e.g., wolverine, white-tailed ptarmigan, graycrowned rosy finch, pika, and hoary marmot) that may be susceptible to effects of climate change.
- In cooperation with Montana Fish Wildlife and Parks' objectives for each hunting district, coordinating elk security with hunter access through road management.
- Using a combination of GIS analysis techniques, available wildlife habitat models, and conducting field surveys to design site-specific vegetation treatments.
- Cooperating in continued citizen science efforts to monitor wildlife.

## Non-native invasive plants

Potential strategies or approaches that may be used in the management of invasive plants include the following:

- Using guidance provided in the "Flathead National Forest Noxious and Invasive Weed Control" environmental assessment and decision notice (2001) ("weed control decision notice") for implementing Integrated Pest Management on the Forest.
- Excluding grazing when new invasive plant species infestations (specifically Priority 1a and 1b species on the Montana State Noxious Weeds List) are found in allotments until eradication of the infestation is complete. These economically damaging species include Dyer's woad, rush skeletonweed, yellow starthistle, etc.
- Prioritizing weed treatments to follow guidance in the weed control decision notice, using an adaptive strategy to determine where, when, and how to treat weeds/weed-infested sites. This strategy and its implementation include consideration of such factors as:
  - ♦ Weed category potential invader, new invader, widespread invader
  - Relative invasive nature of the species and its potential to displace native vegetation
  - Relative ecological importance or rarity of the site that could be damaged by the presence of the weed
  - ♦ Potential for off-site movement of seeds
  - Determination of control method, which is dependent on the species and site
  - Site monitoring to determine the need to repeat or alter treatment
  - Available funding.
- Using weed management program strategies outlined in the weed control decision notice such as:

• Using education, both formal conservation education contacts (schools, campgrounds, etc) and informal (i.e., brochures, weed identification and prevention brochures).

- Providing continuing education for forest field personnel in weed identification
- Pursuing and coordinating cooperative multi-ownership weed control efforts, such as sharing resources and information, setting treatment priorities, and applying for and sharing grants.
- ◆ Using prevention efforts, for example, use of weed seed-free hay and straw by users of Flathead NFS lands, and for reseeding projects
- Using native plants to revegetate disturbed areas where appropriate
- Requiring, contractually in timber sale contracts, that off-road equipment be washed before entering and moving between sites on the forest.

## Fire management and air quality

Fire management approaches are designed to restore fire-adapted landscapes and reduce risk to people, communities, and values. These approaches would also support the three objectives of the National Cohesive Wildland Fire Management Strategy; restore resilient landscapes, maintain fire adapted communities, and provide for effective, safe fire response.

Wildland fire and vegetation management strategies within the wildland-urban interface take a strategic approach for achievement of desired fuel conditions integrating, where feasible, desired conditions for wildlife habitat and other ecological values. Hazardous fuels reduction to mitigate the risk of wildfire to communities and important social values is emphasized in the wildland-urban interface.

#### Management approaches for unplanned ignitions

Potential strategies for fire management (unplanned ignitions, wildfire) could include risk assessment that can occur at multiple scales, both spatial and temporal. These assessments are grounded in experience and analyzed with data and models appropriate to the scale of analysis. The approach is to look at risk in three tiers, long-term (5–10 yrs), annual, and incident:

- ♦ Long-term analyzing the existing conditions that change typically in the 5–10 year time frame, informing broad questions and decisions for programmatic risk assessments. Items may include Highly Values Resources and Assets (HVRA) such as structures, infrastructure, commercial timber, and wildlife habitat.
- Annual analyzing factors such as seasonal weather, fuels condition, and drought impacts to inform decisions pre-season to identify areas that with reduced large fire/long-duration risk may have the opportunity for short-term fire management.
- ◆ Incident when the ignition occurs utilizing the now known specific condition, location, etc., to specifically analyze the situation for incident risk assessments.

Utilization of this three tiered risk analysis would allow managers to make informed decisions that respond to our various desired conditions.

Communicating and collaborating with appropriate agency leadership during fire incident
management, for wildfires that affect identified areas of local, state or tribal importance, to identify
and, to the extent practical, protect these values and minimize impacts to resources or areas of
importance.

• Communicating with the Rocky Mountain Research Station, and consulting manual direction (Forest Service Manual 4063) and individual establishment records, for wildfire response when near or within research natural areas (MA 4a). While the natural process of fire is generally desired within research natural areas, effects to some plant communities, related directly to the fire or to suppression efforts, may be a consideration.

#### Management approaches for prescribed fires (planned ignitions)

Potential strategies that may be used to trend toward desired conditions and objectives for prescribed fire management include the following:

- Burning in autumn when grasses and shrubs have initiated dormancy to promote resprouting of species such as willows, serviceberry, and maple to provide food for wildlife species. At a landscape scale, retaining unburned areas over at least 50 percent of a winter range herd unit to provide forage for the upcoming winter.
- Using burning prescriptions that maintain the deep duff layer to promote survival of huckleberry plants, if present.
- Using burning prescriptions that are relatively hot to scarify the seed of redstem ceanothus, if present.
- Conducting education and outreach to communities.
- Supporting air quality-related monitoring activities and determining sensitivity indicators for the wilderness areas.
- Reviewing projects and management activities that may affect air quality-related values.

#### Recreation

Potential management strategies are those that assist in providing a range of recreation opportunities across the Forest while controlling visitor impacts to resources and other visitors; constructing, maintaining and controlling use of facilities and trails; and providing a positive visitor experience. Potential strategies include the following:

- Prioritizing reconstruction of campgrounds based on the Forest's recreation niche and the updated recreation site facility master planning document. Aligning and right sizing recreation infrastructure to complement regional and forest niche.
- Evaluating potential for new over-snow opportunities and evaluating areas for restricting over-snow opportunities.
- Developing a comprehensive river management plan for the Flathead Wild and Scenic River. Coordinating with appropriate State and Federal agencies when developing and implementing the plan.
- Completing a needs assessment to determine new outfitter, guide, and livery service on the Forest, outside designated wilderness.
- Evaluating the need and location for a hut to hut system on the forest. Work with partners on funding needs.
- Informing and educating users about Leave No Trace techniques for responsible, outdoor activities with minimal impacts on NFS lands.
- Integrating the recreational opportunity spectrum into project level designs and management decisions.

Addressing dispersed campsites with erosion or sanitation issues that need rehabilitation, by
prioritizing sites that protect or maintain wild and scenic river corridors, bull trout habitat, or that are
located within the grizzly bear primary conservation area.

- Addressing developed campgrounds that need improvements, by prioritizing improvements that address accessibility, health and safety, type of use, and reduction of grizzly bear-human interaction.
- Integrating the scenic integrity objectives into project level designs and management decisions.
- Considering protection/maintenance of historic character, while meeting public needs, when identifying cabins to place on the National Reservation System.

#### Wilderness

Potential strategies for wilderness management include the following:

- Revising existing wilderness management plan for the Mission Mountains Wilderness and coordinating with the Confederate Salish Kootenai Tribe when revising.
- Developing limits of acceptable change plan through the public participation process.
- Implementing the National wilderness stewardship performance measures and wilderness character monitoring.

## Other special designations

#### Research natural areas (MA 4a)

A major objective of the Forest Service's research natural area program is to maintain a representative array of all significant natural ecosystems as baseline areas for research and monitoring. The Flathead National Forest has six established research natural areas. The Region 1 Natural Areas Assessment<sup>51</sup> recommended new research national area targets for each forest based on plant community type and priority and its likelihood of occurring on a particular forest. Table C-7 and table C-8 display the as-yet-unfilled plant community type research natural area target recommendations and the associated priority ranking for the Flathead National Forest resulting from the Region 1 assessment.

Table C-7. Unfilled research natural area target recommendations for the forest and woodland class and priority ranking for assessments for the Flathead National Forest

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Forest and Woodland	Priority Ranking
Abies grandis / Athyrium filix-femina	moderate
Abies lasiocarpa / Oplopanax horridum	high
Picea Lysichiton americanum	high
Pseudotsuga menziesii / Agropyron spicatum	moderate
Pseudotsuga menziesii / Cornus stolonifera	high
Pseudotsuga menziesii / Festuca idahoensis	high

<sup>&</sup>lt;sup>51</sup> Chadde, S.W., S.F. Kimball and A.G. Evenden. 1996. Research Natural Areas of the Northern Region: Status and Needs Assessment. USDA Forest Service, Missoula, Montana (unpublished). 179 pp.

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Forest and Woodland	Priority Ranking
Pseudotsuga menziesii / Festuca scabrella	high
Thuja plicata / Athyrium filix-femina	high

Table C-8. Unfilled research natural area target recommendations for the shrubland and herbaceous class and priority ranking for assessments for the Flathead National Forest

Shrubland and Herbaceous	Priority Ranking
Purshia tridentate / Festuca scabrella	high
Festuca scabrella / Agropyron spicatum	high
Festuca scabrella / Festuca idahoensis	high

Field inventories are needed to identify whether these plant community types occur and, if so, where they are located on the Flathead National Forest. As opportunities arise, inventories could be conducted and the process for establishing additional research natural areas could be pursued. Potential strategies to conduct inventories may include partnering with non-agency groups or organizations to locate and inventory the rare plant communities identified in the tables.

The overall approach for management of research natural areas is expressed by a cooperative relationship between the Forest Service and the Rocky Mountain Research Station (see the work of Evenden and others <sup>52</sup> for additional information on research natural areas). The Research Station Director, with the concurrence of the Forest Supervisor, may authorize management practices that are necessary for invasive weed control or to preserve the vegetation for which the research natural area was created (Forest Service Manual 4063.3). As stated in the manual, limited use of vegetation management may occur within research natural areas, in situations where the vegetative type would be lost or degraded without management. The criterion is that management practices provide a closer approximation of the naturally occurring vegetation and the natural processes governing the vegetation than would be possible without management. These practices may include prescribed burning.

In the case of unplanned ignitions that occur in or near research natural areas, consider that natural process of fire is desirable in research natural areas, but may also have potential impacts on plant communities at risk. These impacts would generally be considered acceptable (unless the fire severity is considered outside natural range of variation), but it is recommended to consult research natural area establishment records, manual direction (i.e., Forest Service Manual 4063) and Rocky Mountain Research Station personnel for additional guidance with fire management.

## Special areas (MA 3b)

Possible management approaches and strategies for special areas may include the following:

 Preparing establishment records for new special areas, which could include specific discussion about the features for which they were designated, management guidance, and other related documentation.

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<sup>&</sup>lt;sup>52</sup> Evenden, A.G., M. Moeur, J.S. Shelly, S.F. Kimball and C.A. Wellner. 2001. Research Natural Areas on National Forest System Lands in Idaho, Montana, Nevada, Utah, and Western Wyoming: A Guidebook for Scientists, Managers, and Educators. Gen. Tech. Rep. RMRS-GTR-69. USDA, Forest Service, Rocky Mountain Research Station. Ogden, Utah. 84 pp.

• Forest Service Manual 2372 provides direction for development, occupancy, and public use of Special Areas. Certain kinds of facilities and uses are allowed for interpretive purposes and public use or enjoyment, "up to a level that will insure protection of the special values for which the area was established." Occupancy and use are allowed "to the extent they neither interfere with the primary values for which the area was established nor negatively affect the visitor's experience."

• Evaluating vegetation management or other activities near special areas for potential impacts to plant species and communities, wildlife, hydrology and other associated qualities of the special area

## Coram Experimental Forest (MA 4b)

The overall strategy to managing the Coram Experimental Forest is through the letter of agreement that was made, and entered into, by the Flathead National Forest and Rocky Mountain Research Station (latest update 2014). The agreement provides the operating plan, management guide, and defines the relationship between the Rocky Mountain Research Station and the Flathead National Forest regarding the Coram Experimental Forest. This agreement was prepared in accordance with the requirements and policies set forth in Forest Service Manual 4062, and specifically 4062.5 describing experimental forest management plans.

#### Infrastructure

The overall maintenance strategy for NFS roads is to efficiently maintain NFS roads and reduce the backlog of deferred maintenance. Specific elements of this strategy could include the following:

- Storing infrequently used roads for the long term.
- Reducing maintenance levels on low-use roads while maintaining road drainage features.
- Shifting roads with high residential access needs to non-Forest Service jurisdictions.
- Improving, closing, or decommissioning roads that have adverse impacts on aquatics, watersheds, wildlife.
- Applying dust abatement treatments during weather conditions that promote the binding of treatments to road surface materials.
- When placing road segments in intermittent stored service, at stream crossings consider:
  - Replacing or removing culverts or drainage structures that do not meet size or capacity requirements
    - o If removing a culvert, excavating to the natural stream grade and natural side slopes, or the latter to a 1:1 ratio, whichever is less
  - Constructing armored overflow channels if culverts are retained
  - Stabilizing areas prone to erosion and/or cut and fill failure
- Completing a trails assessment that uses a systematic approach to define the Forest's desired and sustainable trail system.
- During project-level National Environmental Policy Act assessments, identifying forest system trails for mitigation measures to protect trail tread.
- Identifying the trail corridor and associated features for the Pacific Northwest National Scenic Trail Comprehensive Management Plan.
- Using the Travel Analysis Plan to inform project-level decisions.

#### Lands

The strategy for lands management could include the following elements:

 Adjusting land ownership through purchase, exchange or other authority, to protect resources and improve efficiency of management.

- Considering criteria such as the following (not presented in any particular order) when evaluating land adjustments:
  - Lands that can contribute to recovery of threatened or endangered species.
  - ♦ Lands important for wildlife connectivity and big game winter range.
  - Lands needed for the protection of important historical or cultural resources.
  - Lands that enhance recreation, public access, and protection of aesthetic values.
  - Lands that contain rivers with potential for Wild and Scenic designation.
  - Other environmentally sensitive lands.
  - Lands that reduce expenses and support logical and efficient management.
- Considering criteria such as the following (not presented in any particular order) when evaluating land adjustments for conveyance:
  - Lands and administrative buildings adjacent to communities that are chiefly valuable for non-NFS uses.
  - ♦ Lands with low resource value.
  - Inaccessible, isolated, or intermingled ownership parcels.
  - ♦ Lands with long-term, special use permits that are not consistent with national forest purposes and character.
  - Lands not logical or efficient to manage.
  - ♦ Lands eligible under the Small Tracts Act.
- Prioritizing NFS land boundary surveys to areas where trespass is most likely.
- Identifying areas generally suitable for utility corridors and communication sites.
- Authorizing and administering appropriate occupancy and use of NFS lands.

## Special forest products

To lessen impacts on huckleberry plants, the following approaches may be considered:

- Within harvest units, using logging and site preparation methods that lessen mechanical disturbance to roots and root crowns of huckleberry plants.
- Leaving greater density of overstory trees (i.e., more than 20 mature trees per acre) within units on drier, more exposed aspects may improve conditions for huckleberry growth and berry production.

#### **Minerals**

The minerals strategy could include the following elements:

Providing mineral materials such as gravel, rip-rap, and landscape rock for Forest Service, personal, interagency, and limited commercial sales in accordance with material source development and rehabilitation plans.

- Identifying, evaluating, mapping, inventorying, all known cave resources not previously designated as significant.
- Evaluating and mitigating geologic hazards associated with the location and construction of new facilities before they are approved, designed, and constructed.
- Managing caves to minimize evidence of human use and to protect cave resources. Partnerships and mutually-supported agreements could be used to specify schedules, party sizes, skills required, equipment, and handling. Pursuing funding and partnerships to manage cave resources.
- Inspecting minerals materials
- Responding to proposed minerals activities (both locatable and leasable) in a timely manner.

## Livestock grazing

The general approach to grazing management implements resource management practices intended to maintain the health of occupied livestock grazing allotments and rangelands. Strategies for accomplishing this approach may include the following:

- Assessing and updating allotment management plans to ensure that sustainable stocking levels, forage
  utilization standards, mitigation measures, and appropriate grazing systems are used and that lands are
  still suitable for livestock grazing.
- Eliminating grazing allotments or pastures as they become vacant if there is no demand for grazing by potential permittees or if desired vegetation and aquatic conditions cannot be met.

## Cultural resources and areas of tribal importance

The cultural resources strategy could include the following elements:

- Conducting surveys to identify sites, and follow-up actions necessary to protect, stabilize, or salvage sites.
- Using partnership arrangements to help preserve and interpret significant heritage resources.
- Guiding project planning and heritage preservation/interpretation efforts with knowledge and information gained through inventories, site evaluations, tribal consultation, and other sources.
- Developing and participating in national, regional, interregional, and interagency programmatic agreements and memoranda with the State Historic Preservation Office, the Advisory Council on Historic Preservation, and other partner agencies and Tribes.
- Stabilizing, rehabilitating, restoring, and caring for cultural resources.
- Conducting maintenance to historic facilities.
- Promoting heritage values through public education, outreach, and interpretative programs.
- Conducting scientific and historic research on cultural resources.

### **Conservation education**

The conservation education strategy could include the following elements:

• Developing a formal, forestwide conservation education, interpretive, and visitor information strategic plan to guide program delivery, ensure coordinated and effective services, and build strong relationships with partners and communities.

• Using diverse methods and media for program delivery.

Making best use of new technologies to help maintain audience relevancy in the areas of social media, web/internet presence, self-guided media using smart phones and other portable devices.

## **Appendix D: Biophysical Settings and Species Lists**

## **Table of Contents**

Introduction	
Description of Biophysical Settings	D-1
Species Lists	D-5
List of Tables	
Table D-1. Percent and acres (ac) of each biophysical setting on NFS lands within the GAs	D-2
Table D-2. Percent and acres of biophysical settings by management area groupings forestwice	deD-2
Table D-3. Potential vegetation types (PVTs) and biophysical settings used in analysis on the	Flathead
National Forest Plan revision process	D-3
Table D-4. Wildlife species, species status, and habitat associations for the Flathead National	ForestD-5
Table D-5. Plant Species, species status, and habitat associations for the fen (peatland) group	D-34
Table D-6. Plant species, species status, and habitat associations for the aquatic group	D-35
Table D-7. Plant species, species status, and habitat associations for the wetlands / riparian gr	oup D-35
Table D-8. Plant Species, species status, and habitat associations for the alpine group	D-36
Table D-9. Plant species, species status, and habitat associations for the mesic montane, distu	rbance,
rock/talus/scree group	D-36
Table D-10. Invertebrate species, species status, and habitat associations	
Table D-11. Aquatic vertebrate species, species status, and habitat associations	



**Draft Revised Forest Plan** 

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## Introduction

This appendix provides a summary of the plant communities associated with the biophysical settings developed for the Flathead National Forest, and forms the basis for many forest plan components related to vegetation and wildlife habitat. Also provided in the tables are lists of wildlife, plant, fish, and aquatic and terrestrial invertebrate species and their association with the biophysical settings and habitats on the Forest.

## **Description of Biophysical Settings**

Lands across the Flathead National Forest have been grouped into *biophysical settings*, based on broad climatic and site conditions, for purposes of analysis at the forest-wide scale and development of forest plan components. Biophysical settings serve as a basis for description of certain ecological conditions across the forest and are useful to understand the various ecosystems on the forest, their potential productivity, natural biodiversity, and what kind of processes sustain these conditions. In contrast, *plant communities* refer to the existing vegetation types that occur across the landscape at any one point in time. The same plant community may exist on more than one biophysical setting. Discussion and classifications used for the existing plant communities (e.g., vegetation dominance types) are found in appendix 2 of the DEIS, where the vegetation and timber analysis process is described in detail, and references therein. The development of the biophysical settings used for the draft revised forest plan is described below.

Biophysical settings are groupings of potential vegetation types (PVTs), which in turn are groupings of similar habitat types <sup>1</sup>. Habitat types are an aggregation of ecological sites of like biophysical environments (such as climate, aspect, soil characteristics) that produce plant communities of similar composition, structure and function. The vegetation communities that would develop over time given no major natural or human disturbances (i.e., the climax plant community) would be similar within a particular habitat type or potential vegetation type map unit. However, the existing vegetation condition or plant community would vary widely, reflecting each site's unique history, forest character, pattern of disturbances, and point in time along the successional pathways.

The biophysical settings used in the Flathead Forest revised plan are consistent with the Region 1 Broad potential vegetation type groups, as described by Milburn and others<sup>2</sup> in the publication *Region 1 Existing and Potential Vegetation Groupings used for Broad-level Analysis and Monitoring*. Biophysical settings are important considerations in the analysis of vegetation and wildlife habitat conditions, and informed the development of desired conditions and other plan components. Table D-1 provides the acres and proportion of each biophysical setting within the geographic areas (GAs) and within management area groups on the Flathead National Forest. This information provides insight into the distribution of biophysical settings, and the pattern of environmental and vegetative conditions across the forest. Appendix B of the proposed action contains maps displaying biophysical settings.

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<sup>&</sup>lt;sup>1</sup> Habitat types are described in detail in: Pfister, Robert D., Bernard L. Kovalchik, Stephen F. Arno, and Richard C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 174p.

<sup>&</sup>lt;sup>2</sup> Milburn, Amanda; Bollenbacher, Barry, Manning Mary, and Bush, Renate. 2015. Region 1 Existing and Potential Vegetation Groupings used for Broad-level Analysis and Monitoring. R1 Veg. Classification, Mapping, Inventory and Analysis report 15-4 v1.0. USDA Forest Service, Region 1, Missoula, MT. November 13, 2015. http://fsweb.r1.fs.fed.us/forest/inv/r1 tools/R1 allVeg Groups.pdf

Table D-1. Percent and acres (ac) of each biophysical setting on NFS lands within the GAs

Biophysical setting	Hungry Horse GA	Middle Fork GA	North Fork GA	Salish Mtn GA	South Fork GA	Swan Valley GA	Total Percent & Acres Forestwide
Warm-Dry	5%	5%	2%	18%	14%	8%	9%
	13,200	17,600	6,200	48,400	109,100	28,000	222,500
Warm-Moist	2%	<1%	4%	5%	<1%	20%	4%
	6,200	800	13,000	13,000	600	72,700	106,300
Cool-Moist/	85%	75%	72%	76%	58%	57%	68%
Moderately Dry	242,800	275,300	228,100	198,900	459,700	207,300	1,612,100
Cold	6%	14%	21%	1%	21%	9%	14%
	17,100	53,000	67,400	1,800	163,700	32,500	335,500
Grass/forb/shrub	2%	6%	1%	<1%	7%	6%	5%
Hardwood	5,900	21,900	4,300	300	54,300	22,000	108,700
Non-forest							
Total acres <sup>1</sup>	285,200	368,600	319,000	262,400	787,400	362,500	2,385,200

<sup>1.</sup> Excludes water. All acre figures in the table are estimates and rounded to nearest 100 acres. They do not match exactly with acres in other sections of the proposed action, due to variations resulting from the GIS analysis process and the exclusion of water. . Data source: Flathead National Forest GIS Library, R1 VMap layer (2009, updated to 2012 for changes due to disturbances), joined with potential vegetation types GIS layer, US Forest Service - Region One, "Potential Vegetation Type (PVT) Classification of Western Montana and Northern Idaho", completed in 2004 by Jeff Jones, Northern Region, National Fire Plan Cohesive Strategy Team.

Table D-2 shows the biophysical settings by management area groupings forestwide. This table will be completed for the preferred alternative at the final environmental impact statement stage.

Table D-2. Percent and acres of biophysical settings by management area groupings forestwide.

Biophysical Setting	MA 1a	MA 1b	MA 2a, 2b, 3a, 4a, 4b- Coram Exp Forest	MA 5a, 5b, 5c, 5d	MA 6a, 6b, 6c, 4b- Miller Cr Dem For	MA 7
Warm-Dry						
Warm-Moist						
Cool-Moist/ Moderately Dry						
Cold						
Grass/forb/shrub Hardwood, NonFor						
Total acres						

Mapping of potential vegetation types was completed across the Forest Service Northern Region in 2004, using data sources that included field plots, remote sensing and modeling<sup>3</sup>. Table D-3 displays the habitat types and potential vegetation types on the Flathead National Forest and how they are grouped into each biophysical setting. The initial potential vegetation type groups used for discussion of vegetation

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<sup>&</sup>lt;sup>3</sup> USDA, Region 1, Forest Service. 2004. Potential Vegetation Type (PVT) Classification of Western Montana and Northern Idaho. Forest Service Northern Region, Missoula MT. www.fs.usda.gov/detailfull/r1/landmanagement/gis/

conditions in the Flathead Assessment<sup>4</sup> are also provided in table d-3, to facilitate the use and understanding of information published in the Assessment, if desired.

Table D-3. Potential vegetation types (PVTs) and biophysical settings used in analysis on the Flathead National Forest Plan revision process

Habitat Types <sup>a</sup>	PVT Description – FS Region 1 <sup>b</sup>	PVT Code	Assessment <sup>b</sup> PVT Group	Modified Proposed Action Biophysical Setting
pinpon; pinpon/andx; pinpon/agrspi; pinpon/fesida; pinpon/phymal; pinpon/purtri; pinpon/sitcom; pinpon/symalb	Pinus ponderosa (Ponderosa Pine)	pipo	warm, dry	warm dry
psemen/agrspi; psemen/fesida; psemen/fessca	Pseudotsuga menziesii (Douglas-fir) warm dry type 1	psme1	warm, dry	warm dry
psemen/corsto; psemen/linbor; psemen/phymal; psemen/symalb; psemen/vaccae; psemen/vacces; psemen/vacsco; psemen/vacglo; psemen/xerten; psemen/vacmem	Pseudotsuga menziesii (Douglas-fir) moist type 2	psme2	warm, dry	warm dry
psemen/arcuva; psemen/arncor; psemen/calrub; psemen/cargey; psemen/juncom; psemen/spibet	Pseudotsuga menziesii (Douglas-fir) cool dry type 3	psme3	warm, dry	warm dry
abigra/linbor; abigra/vacglo; abigra/xerten; abigra/vacmen	Abies grandis (Grand Fir) moist type 2	abgr2	warm, dry	warm dry
abigra/asacau; abigra/cliuni; abigra/sentri	Abies grandis (Grand Fir) wet type 3	abgr3	warm, moist	warm moist
thupli/asacau; thupli/cliuni	Thuja plicata (Western Red Cedar) moist type 2	thpl2	warm, moist	warm moist
abilas/arncor; abilas/calrub; abilas/cargey; abilas/vaccae; abilas/vacglo; abilas/vacsco; abilas/xerten; pincon/vacglo	Abies lasiocarpa (Subalpine Fir) dry type 3	abla3	cool, mod. dry	cool moist to mod. dry
pincon; pincon/calrub; pincon/linbor; pincon/vaccae; pncon/vacsco; pincon/xerten	Pinus contorta (Lodgepole Pine)	pico	cool, mod. dry	cool moist to mod. dry
tsumer/luzhit; tsumer/menfer; tsumer/xerten	Tsuga mertensiana (Mtn. Hemlock)	tsme	cool, mod. dry	cool moist to mod. dry
abilas/alnsin; abilas/menfer	Abies lasiocarpa (Subalpine Fir) moist type 2	abla2	cool, moist	cool moist to mod. dry
abilas/cliuni; abilas/linbor	Abies lasiocarpa (Subalpine Fir) moist type 2	abla2	cool, moist	cool moist to mod. dry

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 $<sup>^4</sup>$  USDA, Forest Service. 2014. Assessment of the Flathead National Forest. Available online at www.fs.usda.gov/goto/flathead/fpr.

Habitat Types <sup>a</sup>	PVT Description – FS Region 1 <sup>b</sup>	PVT Code	Assessment <sup>b</sup> PVT Group	Modified Proposed Action Biophysical Setting
piceng; piceng/calcan; piceng/cliuni; piceng/corsto; piceng/equarv; piceng/galtri; piceng/linbor; piceng/phymal; piceng/senstr; piceng/smiste; piceng/vacces	Picea (Spruce)	picea	cool, moist	cool moist to mod. dry
tsuhet/asacau; tsuhet/athfil; tsuhet/cliuni; tsuhet/gymdry; tsuhet/menfer	Tsuga heterophylla (Western Hemlock)	tshe	cool, moist	warm moist
abilas/calcan; abilas/descae; abilas/galtri; abilas/oplhor; abilas/salix; abilas/stramp	Abies lasiocarpa (Subalpine Fir) wet type 1	abla1	cool, wet	cool moist to mod. dry
thupli/adiped; thupli/athfil; thupli/gymdry; thupli/oplhor	Thuja plicata (Western Red Cedar) wet type 1	thpl1	cool, wet	warm moist
abilas/luzhit; abilas/pinalb; abilas/ribmon	Abies lasiocarpa (Subalpine Fir) cold type 4	abla4	cold	cold
larlya; larlya/abilas	Larix Iyallii (Subalpine Larch)	laly	cold	cold
pinalb; pinalb/abilas	Pinus albicaulis (Whitebark Pine)	pial	cold	cold

a. Pfister et al, 1977, with the difference being the five letter abbreviation for species, rather than the four letter abbreviation in the Pfister publication.

b. USDA, Forest Service. 2014. Assessment of the Flathead National Forest. Available online at <a href="https://www.fs.usda.gov/goto/flathead/fpr">www.fs.usda.gov/goto/flathead/fpr</a>.

## **Species Lists**

The following table lists species and their association with the diverse ecosystems and habitats of the Flathead National Forest. Table D-4 lists species and their status (e.g., Montana Natural Heritage Program statewide ranking, previously identified as sensitive for the state of Montana and known or suspected to occur on the Flathead National Forest, species listed by the USFWS under the Endangered Species Act, species of conservation concern designated by the Regional Forester for the draft environmental impact statement). Neotropical migratory species are also identified.

Table D-4. Wildlife species, species status, and habitat associations for the Flathead National Forest

Species² Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Acanthis flammea Common Redpoll	G5 S5N	Х							Х	Х	
<i>Acanthis</i> <i>hornemanni</i> ⁵ Hoary Redpoll	G5 SNA	Х								х	
Accipiter cooperii Cooper's Hawk	G5 S4B	Х						Х	Х	Х	Х
Accipiter gentilis Northern Goshawk	G5 S3	Х	х	Х					х	х	х
Accipiter striatus Sharp-shinned Hawk	G5 S4B	Х							Х	Х	х
Actitis macularius Spotted Sandpiper	G5 S5B	Х						Х	Х	Х	
Aechmophorus occidentalis Western Grebe	G5 S4B							х			
Aegolius acadicus Northern Saw- whet Owl	G5 S4	Х		х					х	х	х

Species² Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Aegolius funereus Boreal Owl	G5 S3S4		X	X						X	X
Aeronautes saxatalis White-throated Swift	G5 S5B				Alpine, bedrock, and scree		X				X
Agelaius phoeniceus Red-winged Blackbird	G5 S5B	X					Х	X			
<i>Aix sponsa</i> Wood Duck	G5 S5B			Х		Х		Х			
Alces americanus Moose	G5 S4				Burned forest	X		X	X	Х	
Ambystoma macrodactylum Long-toed Salamander	G5 S4							Х	Х	Х	Х
Ambystoma mavortium Tiger Salamander	G5 S4	Х						Х			
Ammodramus savannarum Grasshopper Sparrow	G5 S4B	X					X		Х	Х	
Anas acuta Northern Pintail	G5 S5B	Х				Х		Х			
Anas americana American Wigeon	G5 S5B					Х		Х			
Anas clypeata Northern Shoveler	G5 S5B	Х				х		Х			

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Anas crecca Green-winged Teal	G5 S5B					X		X			
Anas cyanoptera Cinnamon Teal	G5 S5B					Х		Х			
Anas discors Blue-winged Teal	G5 S5B					Х		Х			
Anas penelope <sup>5</sup> Eurasian Wigeon	G5 SNA					Х		Х	Х		
Anas strepera Gadwall	G5 S5B					Х		Х			
Anaxyrus boreas Boreal (Western) Toad	G4 S2, on sensitive species list for FNF and adjacent forests			X	Burned forest			x	х	X	х
Anthus rubescens American Pipit	G5 S4B				Alpine			Х	Х		
Aquila chrysaetos Golden Eagle	G5 S3	Х								Х	Х
Archilochus alexandri Black-chinned Hummingbird	G5 S4B	Х					X	X	Х		
Ardea herodias Great Blue Heron	G5 S3	Х						Х	Х	х	
Ascaphus montanus Tailed Frog	G4 S4		х	Х	Cold swift water			Х			

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Asio flammeus Short-eared Owl	G5 S4	Х							X		
Aythya affinis Lesser Scaup	G5 S5B					X		X			
Aythya americana Redhead	G5 S5B					Х		Х			
Aythya collaris Ring-necked Duck	G5 S5B					Х		Х			
Aythya marila Greater Scaup	G5 SU					Х		Х			
Aythya valisineria Canvasback	G5 S5B					Х		Х			
Bombycilla cedrorum Cedar Waxwing	G5 S5B	Х					Х	Х	х	х	Х
Bombycilla garrulus Bohemian Waxwing	G5 S5N	X							Х		Х
Bonasa umbellus Ruffed Grouse	G5 S4	Х		Х		Х		Х	Х	Х	
Botaurus lentiginosus American Bittern	G4 S3B							Х	X		
Branta canadensis Canada Goose	G5 S5B	Х				Х		Х	Х		
Bubo scandiacus <sup>5</sup> Snowy Owl	G5 SNA	Х							Х	Х	
Bubo virginianus Great Horned Owl	G5 S5	х		х				Х	Х	Х	Х

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Bucephala albeola Bufflehead	G5 S5B			Х		X		X			
Bucephala clangula Common Goldeneye	G5 S5			Х		X		X			
Bucephala islandica Barrow's Goldeneye	G5 S4			X		X		X		X	
Buteo jamaicensis Red-tailed Hawk	G5 S5B	Х							Х	Х	Х
<i>Buteo lagopus</i> Rough-legged Hawk	G5 S5N	Х								х	X
Buteo swainsoni Swainson's Hawk	G5 S4B	Х							Х	Х	
Calidris alba <sup>5</sup> Sanderling	G5 SNA	Х						Х			
Calidris pusilla <sup>5</sup> Semipalmated Plover	G5 SNA	Х						X			
Callospermophius lateralis Golden-mantled Ground Squirrel	G5 S4				Krummholz						х
Canis latrans Coyote	G5 S5	Х				X <sub>6</sub>			Х	X	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
<i>Canis lupus</i> Gray Wolf	G4 S4, on RF sensitive species list for FNF and adjacent forests	Х				x		х	Х	X	x
Cardellina pusilla Wilson's Warbler	G5 S5B	Х					Х	Х	х		Х
Castor canadensis Beaver	G5 S5	Х				Х		Х	Х	Х	
Cathartes aura Turkey Vulture	G5 S4B	Х			Cliffs		Х		Х	Х	
Catharus fuscescens Veery	G5 S3B	Х					Х	Х	х	Х	
Catharus guttatus Hermit Thrush	G5 S5B		х				Х		Х	Х	Х
Catharus ustulatus Swainson's Thrush	G5 S5B	Х	Х				Х		Х	Х	Х
Catherpes mexicanus Canyon Wren	G5 S4									Х	
Certhia americana Brown Creeper	G5 S3		х	Х					Х	Х	
Cervus canadensis Elk	G5 S5	Х			Burned forest	Х			х	х	x
Chaetura vauxi Vaux's Swift	G5 S4B		Х	х			Х	Х	Х	Х	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Charadrius vociferus Killdeer	G5 S5B	X						X	X		x
Charina bottae Rubber Boa	G5 S4							X	Х	X	
Chen caerulescens Snow Goose	G5 S4N	Х				X		Х			
Chlidonias niger Black Tern	G4 S3B							X	X		
Chordeiles minor Common Nighthawk	G5 S5B	X					Х		X		
Chrysemys picta Painted Turtle	G5 S4	Х						Х	Х	Х	
Cinclus mexicanus American Dipper	G5 S5							Х			
Circus cyaneus Northern Harrier	G5 S4B	X						X	X	X	X
Cistothorus palustris Marsh Wren	G5 S5B	Х						X	X		
Coccothraustes vespertinus Evening Grosbeak	G5 S3	Х							Х	х	X
Colaptes auratus Northern Flicker	G5 S5	Х		х				Х	Х	Х	Х
<i>Columba livia</i> ⁵ Rock Pigeon	G5 SNA	Х			Cliffs, buildings				Х		

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Contopus cooperi Olive-sided Flycatcher	G4 S4B	X		x	Burned forest		Х		X	X	X
Contopus sordidulus Western Wood- Pewee	G5 S5B	Х					Х	X	Х		
Corvus brachyrhynchos American Crow	G5 S5B								X	X	X
Corvus corax Common Raven	G5 S5	Х							Х		Х
Corynorhinus townsendii Townsend's Big- eared Bat	G3G4, FNF SCC, on RF sensitive species list for FNF and adjacent forests	X		X	Caves			X	X		
Molothrus ater Brown-headed Cowbird	G5 S5B	Х					Х	Х	х	х	
Cyanocitta cristata Blue Jay	G5 S5							Х	Х		Х
Cyanocitta stelleri Steller's Jay	G5 S5	Х							Х	Х	Х
Cygnus buccinator Trumpeter Swan	G4 S3	Х						Х	Х		
<i>Cygnus</i> <i>columbianus</i> ⁵ Tundra Swan	G5 SNA	Х						Х	Х		

Species² Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Cypseloides niger Black Swift	G4 S1B, FNF SCC				Waterfalls		X	X	X	X	X
Dendragapus obscurus Dusky Grouse	G5 S4	Х				Х			Х	Х	х
Dolichonyx oryzivorus <sup>4</sup> Bobolink	G5 S3B	х					Х	Х	х		
<i>Dryocopus</i> <i>pileatus</i> Pileated Woodpecker	G5 S3		X	Х				X	X	X	X
Dumetella carolinensis Gray Catbird	G5 S5B	Х					Х	Х	Х	Х	
Elgaria coerulea Northern Alligator Lizard	G5 S3				Rock				Х		
Empidonax hammondii Hammond's Flycatcher	G5 S4B	Х	X				x		Х	X	Х
Empidonax minimus Least Flycatcher	G5 S5B	Х					Х	Х	Х	Х	
Empidonax oberholseri Dusky Flycatcher	G5 S5B	Х			Burned forest		Х		х	х	
Empidonax occidentalis Cordilleran Flycatcher	G5 S4B	X			Cliffs		Х		Х	Х	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Empidonax traillii Willow Flycatcher	G5 S4B	Х					Х	Х	Х		X
Eptesicus fuscus Big Brown Bat	G5 S4			Х	Caves			Х	X	X	
Eremophila alpestris Horned Lark	G5 S5	Х								х	X
Euphagus cyanocephalus Brewer's Blackbird	G5 S5B	Х					Х	Х	х		х
Falcipennis canadensis Spruce Grouse	G5 S4		х			Х				х	
Falco columbarius Merlin	G5 S4	Х					Х		Х		
Falco mexicanus Prairie Falcon	G5 S4	Х					Х		Х		Х
Falco peregrinus Peregrine Falcon	G4 S3, on RF sensitive species list for FNF and adjacent forests	X			Cliffs		X	х	X	X	X
Falco sparverius American Kestrel	G5 S5	Х		Х			Х		Х		Х
Fulica americana American Coot	G5 S5B					Х		Х			
Gallinago delicata Wilson's Snipe	G5 S5	Х				Х		Х	Х		

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
<i>Gavia immer</i> Common Loon	G5 S3B, on RF sensitive species list for FNF and adjacent forests							X			
Geothlypis tolmiei MacGillivray's Warbler	G5 S5B	X					Х	X	X	x	X
Geothlypis trichas Common Yellowthroat	G5 S5B	Х					Х	Х	X	Х	X
Glaucidium gnoma Northern Pygmy- Owl	G4G5 S4	Х		Х					Х	Х	х
Glaucomys sabrinus Northern Flying Squirrel	G5 S4		X	Х				X	X	X	
Grus canadensis Sandhill Crane	G5 S5BS2N	Х						Х	Х	Х	
<i>Gulo gulo</i> Wolverine	G4 S3, on RF sensitive species list for FNF and adjacent forests				Persistent snow	Trapping currently on hold			X	X	x
Haemorhous cassinii Cassin's Finch	G5 S3	Х			Burned forest				X	Х	Х

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Haemorhous mexicanus House Finch	G5 S5	X							X	X	
Haliaeetus leucocephalus Bald Eagle	G5 S4, on RF sensitive species list for FNF and adjacent forests	X	X	X				Х	X	X	X
Hirundo rustica Barn Swallow	G5 S5B	Х					Х	Х	Х	Х	
Histrionicus histrionicus Harlequin Duck	G4 S2B, FNF SCC, on RF sensitive species list for FNF and adjacent forests		x	X	Cold swift water	x		Х		X	
Icterus bullockii <sup>4</sup> Bullock's Oriole	G5 S5B	Х					Х	Х	Х	Х	
Ixoreus naevius Varied Thrush	G5 S3B		Х						X	X	X
Junco hyemalis Dark-eyed Junco	G5 S5B	Х							X	X	X
Lagopus leucura White-tailed Ptarmigan	G5 S3	х			Alpine- Krumholzpe rsistent snow						Х
Lanius excubitor Northern Shrike	G5 S5N	Х							Х	Х	
Larus californicus California Gull	G5 S5B	Х						Х	Х	Х	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
<i>Larus</i> <i>delawarensis</i> Ring-billed Gull	G5 S5B	x						X		X	
Lasionycteris noctivagans Silver-haired Bat	G5 S4	х	х	х	Caves			Х	х	х	
Lasiurus cinereus Hoary Bat	G5 S3	х			Caves			Х	Х	Х	
Lepus americanus Snowshoe Hare	G5 S4	Х						Х	Х	X	
Leucosticte tephrocotis Gray-crowned Rosy-Finch	G5 S2BS5N	х			Persistent snow					X	X
Limnodromus scolopaceus <sup>5</sup> Long-billed Dowitcher	G5 SNA	Х						x			
Lithobates catesbeianus Bullfrog	G5							Х			
<i>Lithobates</i> <i>pipiens⁴</i> Northern Leopard Frog	G5 S1S4, on RF sensitive species list for FNF and adjacent forests	Х						X	х		
Lontra canadensis Northern River Otter	G5 S4					Х		Х	X	X	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Lophodytes cucullatus Hooded Merganser	G5 S4			X		X		X			
Loxia curvirostra Red Crossbill	G5 S5									Х	Х
Loxia leucoptera White-winged Crossbill	G5 S4								X		X
<i>Lynx canadensi</i> s Canada Lynx	G5 S3, Threatened		Х	Х					X (warm moist only)	X	X
<i>Lynx rufus</i> Bobcat	G5 S5	Х		Х		Х		Х	Х	Х	
Marmota caligata Hoary Marmot	G5 S3 S4	Х			Alpine boulder fields					X	X
Marmota flaviventris Yellow-bellied Marmot	G5 S4								Х		
Martes americana Marten	G5 S4		X	Х		Х			X	X	X
<i>Martes pennanti</i> Fisher	G5 S3, FNF SCC, on RF sensitive species list for FNF and adjacent forests		x	x		x			X	X	
<i>Megaceryle</i> <i>alcyon</i> Belted Kingfisher	G5 S5B	X					х	Х	X	х	Х

Species² Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Megascops kennicottii Western Screech- Owl	G5 S3S4	X		X				X	X	X	
<i>Melanerpes lewis</i> Lewis's Woodpecker	G4 S2B			х	Burned forest			Х	х		
<i>Meleagris</i> <i>gallopavo</i> ⁵ Wild Turkey	G5 SNA	Х				X		X	X		
Melospiza lincolnii Lincoln's Sparrow	G5 S5B	Х					Х	Х	Х	Х	
Melospiza melodia Song Sparrow	G5 S5B	Х						Х	Х	Х	Х
Mephitis mephitis Striped Skunk	G5 S5	Х						Х	Х		
Mergus merganser Common Merganser	G5 S5B			Х		Х		Х			
<i>Mergus serrator</i> <sup>5</sup> Red-breasted Merganser	G5 SNA					х		Х			
Microtus Iongicaudus Long-tailed Vole	G5 S4							Х	Х	х	
Microtus montanus Montane Vole	G5 S5							Х	х	х	
Microtus pennsylvanicus Meadow Vole	G5 S5	Х						Х	х	х	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Microtus richardsoni Water Vole	G5 S4							Х	X	x	
Mustela erminea Short-tailed Weasel	G5 S5	Х				Х		Х	х	Х	
Mustela frenata Long-tailed Weasel	G5 S5	Х				Х		Х	х	х	
Mustela nivalis Least Weasel	G5 S4					Х			Х		
Mustela vison Mink (American)	G5 S5	Х				х		Х			
Myadestes townsendi Townsend's Solitaire	G5 S5	Х			Burned forest				Х	Х	Х
Myodes gapperi Southern Red- backed Vole	G5 S4		х	Х				Х	х	х	X
Myotis californicus California Myotis	G5 S4				Caves			Х	Х	Х	
Myotis ciliolabrum Western Small- footed Myotis	G5 S4				Caves			Х	х	х	
Myotis evotis Long-eared Myotis	G5 S4			х	Caves			Х		Х	
Myotis lucifugus Little Brown Myotis	G3 S4			х				Х	х	Х	

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
<i>Myotis volans</i> Long-legged Myotis	G5 S4			х	Caves					x	
<i>Myotis</i> <i>yumanensis</i> Yuma Myotis	G5 S3S4			X				X			
Neotoma cinerea Bushy-tailed Woodrat	G5 S5			х	Caves, cliffs				Х	x	
<i>Nucifraga</i> <i>columbiana</i> Clark's Nutcracker	G5 S3, FNF SCC				Whitebark pine				х	х	х
Numenius americanus Long-billed Curlew	G5 S3B	Х						X			
Ochotona princeps Pika	G5 S4	Х			Alpine talus, boulder fields					Х	Х
Odocoileus hemionus Mule Deer	G5 S5	Х				х			Х	х	X
Odocoileus virginianus White-tailed Deer	G5 S5	Х				х		Х	х	х	
Ondatra zibethicus Muskrat	G5 S5	Х				х		Х	х		
Oreamnos americanus Mountain Goat	G5 S4	Х			Cliffs	х				x	x

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Oreothlypis celata Orange-crowned Warbler	G5 S5B	X					X		X	×	×
Oreothlypis peregrina Tennessee Warbler	G5 S3S4B						X	X		X	
Oreothlypis ruficapilla Nashville Warbler	G5 S5B	X					X		X	x	
Otus flammeolus Flammulated Owl	G5 S3B, FNF SCC, on RF sensitive species list for FNF and adjacent forests	X	X	X			X		X		
<i>Ovis canadensis</i> Bighorn Sheep	G4 S4, on RF sensitive species list for FNF and adjacent forests	X			Cliffs	X					X
Oxyura jamaicensis Ruddy Duck	G5 S5B					X		X			
Pandion haliaetus Osprey	G5 S5B	Х		х			Х	Х	X	X	X
Parkesia noveboracensis Northern Waterthrush	G5 S5B	Х					Х	х		X	

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Passer domesticus⁵ House Sparrow	G5 SNA	Х		X		X <sub>6</sub>			X	X	x
Passerculus sandwichensis Savannah Sparrow	G5 S5B	X					Х		Х	X	
Passerella iliaca Fox Sparrow	G5 S5B	X						Х	X	X	X
Passerina amoena Lazuli Bunting	G5 S4B	X					Х	X	X	x	
<i>Patagioenas</i> <i>fasciata</i> ⁵ Band-tailed Pigeon	G4 SNA								Х		
Perisoreus canadensis Gray Jay	G5 S5								Х	х	X
Peromyscus maniculatus Deer Mouse	G5 S5	Х						Х	х	х	Х
Petrochelidon pyrrhonota Cliff Swallow	G5 S5B	Х			Cliffs		Х	Х	х		Х
Phalacrocorax auritus Double-crested Cormorant	G5 S5B							х		X	
Phalaropus tricolor Wilson's Phalarope	G5 S4B	X						Х			

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Phenacomys intermedius Heather Vole	G5 S4							X	X	X	
Pheucticus ludovicianus⁵ Rose-breasted Grosbeak	G5 SNA						X	X		X	
Pheucticus melanocephalus Black-headed Grosbeak	G5 S5B	X					X	X	X		X
Pica hudsonia Black-billed Magpie	G5 S5	Х							х	Х	
Picoides arcticus Black-backed Woodpecker	G5 S3, on RF sensitive species list for FNF and adjacent forests			X	Burned forest				X	X	X
Picoides dorsalis American Three- toed Woodpecker	G5 S4		X	X	Burned forest				X	X	X
Picoides pubescens Downy Woodpecker	G5 S5			X				X	X	X	X
Picoides villosus Hairy Woodpecker	G5 S5		х	Х	Burned forest				Х	Х	Х
Pinicola enucleator Pine Grosbeak	G5 S5	Х	Х						Х	Х	Х

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Pipilo maculatus Spotted Towhee	G5 S5B	Х						X		X	
Piranga Iudoviciana Western Tanager	G5 S5B	X					Х		X	X	X
Pituophis catenifer Gopher Snake	G5 S5	Х							Х		
Anas platyrhynchos Mallard	G5 S5					X		X			
Plectrophenax nivalis Snow Bunting	G5 S5N	Х							Х	х	
Podiceps auritus Horned Grebe	G5 S3B							Х			
Podiceps grisegena Red-necked Grebe	G5 S4B							X			
Podiceps nigricollis Eared Grebe	G5 S5B							Х			
Podilymbus podiceps Pied-billed Grebe	G5 S5B							X			
Poecile atricapillus Black-capped Chickadee	G5 S5	Х		х				Х	Х	Х	X
Poecile gambeli Mountain Chickadee	G5 S5			х					Х	Х	Х

Species <sup>2</sup> Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Poecile hudsonicus Boreal Chickadee	G5 S3		X	X						×	×
Poecile rufescens Chestnut-backed Chickadee	G5 S4		Х	X					X	x	x
Pooecetes gramineus Vesper Sparrow	G5 S5B	Х					Х		х	Х	
Porzana carolina Sora	G5 S5B	Х						Х			
Procyon lotor Raccoon	G5 S5	Х		Х		X <sub>6</sub>		Х	Х		
Pseudacris regilla Pacific Treefrog	G5 S4	Х						Х	Х	Х	
Puma concolor Mountain Lion	G5 S4	Х				Х			Х	Х	Х
Quiscalus quiscula⁴ Common Grackle	G5 S5B	Х						Х	х		
<i>Rallus limicola⁴</i> Virginia Rail	G5 S5B							Х	Х		
Rana luteiventris Columbia Spotted Frog	G4 S4	Х						Х	х	х	X
Rangifer tarandus caribou <sup>5</sup> Woodland Caribou	G5T4 SX		Х							Х	
Recurvirostra americana American Avocet	G5 S4B							Х	X		

Species <sup>2</sup> Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Regulus calendula Ruby-crowned Kinglet	G5 S5B						Х		X	X	X
Regulus satrapa Golden-crowned Kinglet	G5 S5		X						X	X	X
Riparia riparia Bank Swallow	G5 S5B	Х					Х	X	X	X	X
Sayornis saya Say's Phoebe	G5 S5B	Х					Х			Х	
Selasphorus calliope Calliope Hummingbird	G5 S5B	X					x	x	Х	X	х
Selasphorus rufus Rufous Hummingbird	G5 S4B	Х					Х	Х	Х	Х	х
Setophaga coronata Yellow-rumped Warbler	G5 S5B	Х							х		х
Setophaga petechia Yellow Warbler	G5 S5B	Х					Х	Х	х		
Setophaga ruticilla American Redstart	G5 S5B	Х					Х	Х	Х	Х	
Setophaga townsendi Townsend's Warbler	G5 S5B		x				Х		х	x	х
Sialia currucoides Mountain Bluebird	G5 S5B	Х		Х	Burned forest				Х		Х

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Sialia mexicana Western Bluebird	G5 S4B	Х		х					Х	Х	
Sitta canadensis Red-breasted Nuthatch	G5 S5		Х	X					X	x	x
Sitta carolinensis White-breasted Nuthatch	G5 S4		Х	х				Х	X		x
Sitta pygmaea Pygmy Nuthatch	G5 S4		Х	Х					Х	Х	
Sorex cinereus Masked Shrew	G5 S5	Х						Х	Х	Х	
Sorex hoyi Pygmy Shrew	G5 S3	Х						X		Х	
Sorex monticolus Dusky or Montane Shrew	G5 S5								X	X	
Sorex palustris Water Shrew	G5 S4							Х	Х	Х	
Sorex vagrans Vagrant Shrew	G5 S4	Х						Х	Х	Х	
Sphyrapicus nuchalis Red-naped Sapsucker	G5 S4B			X			X	X	X	Х	Х
Sphyrapicus thyroideus Williamson's Sapsucker	G5 S4B			Х			X		X		
Spinus pinus Pine Siskin	G5 S5	Х							Х	Х	Х

Species² Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Spinus tristis American Goldfinch	G5 S5B	X						X	X		x
<i>Spizella arborea</i> ⁵ American Tree Sparrow	G5 SNA	Х							Х	х	X
Spizella pallida Clay-colored Sparrow	G5 S4B	Х					Х		Х		
Spizella passerina Chipping Sparrow	G5 S5B	Х					Х		Х	Х	Х
Stelgidopteryx serripennis Northern Rough- winged Swallow	G5 S5B	X					Х	х	Х	Х	Х
Streptopelia decaocto <sup>5</sup> Eurasian Collared- Dove	G5 SNA					X <sub>6</sub>			х		
Strix nebulosa Great Gray Owl	G5 S3	Х		Х	Cliffs				Х	Х	Х
Strix varia Barred Owl	G5 S4			Х				Х	Х	Х	Х
Sturnella neglecta Western Meadowlark	G5 S5B	Х							Х	Х	Х
Sturnus vulgaris <sup>5</sup> European Starling	G5 SNA	Х							Х	Х	Х
Surnia ulula Northern Hawk Owl	G5 S3	Х		Х	Burned forest				Х	X	

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Synaptomys borealis Northern Bog Lemming	G5 S2, on RF sensitive species list for FNF and adjacent forests				Peatlands			X		X	
Tachycineta bicolor Tree Swallow	G5 S5B	х		X			X	x	x	x	
Tachycineta thalassina Violet-green Swallow	G5 S5B	Х		X	Cliffs		x	x	X	X	Х
Tamias amoenus Yellow-pine Chipmunk	G5 S5							Х	Х	х	
Tamias ruficaudus Red-tailed Chipmunk	G5 S4							Х	х	х	
Tamiasciurus hudsonicus Red (Pine) Squirrel	G5 S5			Х				х	X	x	Х
Taxidea taxus Badger	G5 S4	Х				X <sup>6</sup>			Х	Х	
Thamnophis elegans Terrestrial Gartersnake	G5 S5	Х						×	X	Х	Х

Species² Name	Species Status¹	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Thamnophis elegans Western Terrestrial Garter Snake	G5 S5	X						X			
Thamnophis sirtalis Common Gartersnake	G5 S4	X						X	X	X	
Thomomys talpoides⁵ Northern Pocket Gopher	G5 S5	X							Х	X	X
Tringa flavipes <sup>5</sup> Lesser Yellowlegs	G5 SNA	Х						Х	Х		
<i>Tringa</i> <i>melanoleuca</i> <sup>5</sup> Greater Yellowlegs	G5 SNA	X						X	Х		
Tringa solitaria <sup>5</sup> Solitary Sandpiper	G5 SNA	Х						Х			
Troglodytes aedon House Wren	G5 S5B	Х		Х			Х		Х	Х	
Troglodytes pacificus Pacific Wren	G5 S3		X	х				Х	Х	х	X
Turdus migratorius American Robin	G5 S5B	Х			Burned forest		Х	Х	х	х	Х
Tyrannus tyrannus Eastern Kingbird	G5 S5B	Х					Х	Х	Х	Х	

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
<i>Tyrannus</i> <i>verticalis</i> Western Kingbird	G5 S5B	X					X		X	X	
Urocitellus columbianus Columbian Ground Squirrel	G5 S5	Х							X	X	X
Ursus americanus Black Bear	G5 S5	X	X	X		X		X	X	X	X
Ursus arctos Grizzly Bear	G4 S2S3, Threatened	Х			Burned forest			X	X	X	X
Vireo cassinii Cassin's Vireo	G5 S4B	Х					Х		Х	Х	Х
Vireo gilvus Warbling Vireo	G5 S5B	Х					Х	Х	Х	Х	Х
Vireo olivaceus Red-eyed Vireo	G5 S4B	Х					Х	Х	Х	Х	
Vulpes vulpes Red Fox	G5 S5	Х				X <sup>6</sup>		Х	Х	Х	
Xanthocephalus xanthocephalus Yellow-headed Blackbird	G5 S5B	Х					×	х			
Zapus princeps Western Jumping Mouse	G5 S4							Х	х	Х	
Zenaida macroura Mourning Dove	G5 S5B	Х						Х	Х	Х	
Zonotrichia albicollis⁵ White-throated Sparrow	G5 SNA	Х							Х	X	

Species <sup>2</sup> Name	Species Status <sup>1</sup>	Grass- forb- shrub	Old- growth	Snag or Downed Log	Unique³ Habitat Associate	Hunted or Trapped	Neo- tropical migrant	Aquatic, Wetland, and/or Riparian	Warm Moist to Warm-dry Biophysical Setting	Cool Wet to Cool-Dry Biophysical Setting	Cold Biophysical Setting
Zonotrichia leucophrys White-crowned Sparrow	G5 S5B	х							Х		X
Zonotrichia querula⁵ Harris's Sparrow	G5 SNA	x								x	

- 1. Global (G1-5) and State (S1-5) species ranking from Montana National Heritage Program list, obtained December 2013; Regional Forester's species of conservation concern (SCC) list as of May 2016; 2011 Regional Forester's sensitive species list for the Kootenai, Lolo, or Lewis and Clark/Helena National Forests and species previously identified as sensitive for the Flathead National Forest; (Note: species status may change over time and subsequent updates are anticipated).
- 2. Species with only one or two total observations in the Montana Natural Heritage Program database were not listed. The species in this table have known occurrence on or within 0.5 mile of Flathead National Forest lands as of 2013. The list was reviewed by T. Their and C. Hammond (Montana Fish, Wildlife and Parks), D. Casey of American Bird Conservancy, and S. Gniadek of Flathead Audubon (December 2014).
- 3. Habitat associations based upon GIS analysis of Montana Natural Heritage Program data. Habitat associations reviewed and edited by T. Their and C. Hammond (Montana Fish, Wildlife and Parks) in December 2014. Includes features such as caves, talus, snowfields/glaciers, fell/boulder fields, cliffs, waterfalls, and intensively burned habitats.
- 4. Typically valley-bottom species that do not occur on NFS lands.
- 5. Montana Natural Heritage Program has determined a conservation status rank is not applicable because the species is not a suitable target for conservation activities as a result of being: (1) not confidently present in the state; (2) exotic or introduced; (3) a long distance migrant with accidental or irregular stopovers; or (4) a hybrid without conservation value; (5) species is believed to be extinct throughout its range or extirpated in Montana; or is believed to be incidental on NFS lands based on specific observations of animals or their tracks.
- 6. Species hunted or trapped but not regulated by Montana Fish, Wildlife and Parks, Region 1.

Table D-5 through table D-9 lists rare plant species that represent the diversity of habitats on the Flathead Forest. The tables show plant species previously identified as sensitive and known to occur on the Forest, threatened and endangered species, and species of conservation concern as designated by the Regional Forester for the draft environmental impact statement. A brief description of habitat associations is provided. More detailed information on plant characteristics, habitats, distribution, and observations is available from the Montana Natural Heritage Program and NatureServe databases.

Table D-5. Plant species, species status, and habitat associations for the fen (peatland) group

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Amerorchis rotundifolia Roundleaf orchid	SCC	Sensitive	SOC	G5 S3	Spruce forest around seeps or along streams, often in soil derived from limestone.
Carex chordorrhiza Creeping Sedge	SCC	Sensitive	_	G5 S3	Wet, organic soil of fens in the montane zone.
Carex lacustris Lake-bank Sedge	SCC	Sensitive	_	G5 S1 S2	Marshes and fens.
Cypripedium parviflorum Small Yellow Lady's-slipper	Not SCC	Sensitive	_	G5 S3 S4	Fens, damp mossy woods, seepage areas, and moist forest- meadow ecotones in the valley to lower montane zones.
Cypripedium passerinum Sparrow's-egg Lady's- slipper	SCC	Sensitive	_	G4G5 S2 S3	Mossy, moist, or seepy places in coniferous forests, often on calcareous substrates.
<i>Drosera anglica</i> English Sundew	Not SCC	Sensitive	_	G5 S3	With spaghnum moss in wet, organic soils of fens in the montane zone.
Drosera linearis Slenderleaf Sundew	SCC	Sensitive	_	G4 S2	Wet, organic soil of nutrient-poor fens in the montane zone. Resides in specialized, limited habitat (wilderness and RNA).
Eleocharis rostellata Beaked Spikerush	SCC	Sensitive	_	G5 S3	Wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones.
Eriophorum gracile Slender Cottongrass	SCC	Sensitive	_	G5 S3	Wet, organic soil of fens from low to moderate elevations.
Howellia aquatilis Water howellia	Not SCC	USFWS Threatened	_	_	Wetlands and peatlands.
<i>Liparis loeselii</i> Loesel's Twayblade	SCC	Sensitive	_	G5 S2	Wet, organic soils of calcareous fens in the valley and montane zones.
Lycopodium inundatum Northern Bog Clubmoss	SCC	Sensitive	SOC	G5 S2	Wet, organic soil of nutrient-poor fens in the valley and lower montane zones.
Meesia triquetra Meesia moss	SCC	Sensitive	_	G5 S2	Collected on forest from fen and peat dome at base of slope, fed by perennial springs, collected from shallow pool and wet lawn.  Also found at edge of pond in the wilderness.

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Scheuchzeria palustris Pod Grass	Not SCC	Sensitive	_	G5 S3	Wet, organic soil of fens in the valley and montane zones, usually with Sphagnum moss.
Scorpidium scorpioides Scorpidium moss	SCC	Sensitive	_	G4G5 S2	Found on wet soil in calcareous seeps and fens.
Sphagnum magellanicum Magellan's Peatmoss	SCC	_	SOC	G5S1	Rich fens, peatlands (Schofield 1992)
Trichophorum cespitosum Tufted Club-rush	SCC	Sensitive	SOC	G5 S2	Wet meadows and sphagnum-dominated fens in the montane to alpine zones.

<sup>1.</sup> Species previously listed as sensitive by the Regional Forester as of January 2016. USFWS T&E, Proposed, or Candidate Species 4/20/2016 listing.

Table D-6. Plant species, species status, and habitat associations for the aquatic group

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Bidens beckii Beck Water-marigold	Not SCC	Sensitive	SOC	G4G5 S2	Still or slow-moving water of lakes, rivers, and sloughs in the valleys, 0.1-3 m deep.
Heteranthera dubia Water Star-grass	Not SCC	Sensitive	_	G5 S1S2	Shallow water of riverine sloughs, backwaters; valleys
Potamogeton obtusifolius Blunt-leaved Pondweed	Not SCC	Sensitive	_	G5 S3	Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones.
Schoenoplectus subterminalis Water Bulrush	Not SCC	Sensitive	SOC	G4G5 S3	Found in open water and boggy margins of ponds, lakes, and sloughs at 0.1-3 m depth in the valley, foothill, and montane zones.

<sup>1.</sup> Species previously listed as sensitive by the Regional Forester as of January 2016. USFWS T&E, Proposed, or Candidate Species 4/20/2016 listing.

Table D-7. Plant species, species status, and habitat associations for the wetlands / riparian group

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Dryopteris cristata Crested shieldfern	SCC	Sensitive	_	G5 S3	Moist to wet, often organic soils at the forest margins of fens and swamps in the montane zone.
Epipactis gigantean Giant Helleborine	SCC	Sensitive	_	G4 S2S3	Stream banks, lake margins, fens with springs and seeps, often near thermal waters.
Mimulus ampliatus Stalk-leaved Monkeyflower	Not SCC	Sensitive	_	G3 S3	Open seeps and vernally moist soil along slopes, cliffs and streams from the valleys to the subalpine zone.

<sup>2.</sup> Montana Natural Heritage Program state status Species of Concern (SOC) and Global (G1-5) and State (S1-5) Species Rankings.

<sup>2.</sup> Montana Natural Heritage Program state status Species of Concern (SOC) and Global (G1-5) and State (S1-5) Species Rankings.

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Ophioglossum pusillum Adder's Tongue	Not SCC	Sensitive	_	G5 S3	Wet meadows, margins of fens, and gravelly moist soil in the valley and montane zones.
Petasites frigidus var. frigidus Arctic Sweet Coltsfoot	SCC	Sensitive	SOC	G5T5 S2	Swamps, fen margins, and riparian seeps within open forest and meadows in the valley and foothill zones.

- 1. Species previously listed as sensitive by the Regional Forester as of January 2016. USFWS threatened and endangered, proposed, or candidate species 4/20/2016 listing.
- 2. Montana Natural Heritage Program state status species of concern (SOC) and Global (G1-5) and State (S1-5) species rankings.

Table D-8. Plant species, species status, and habitat associations for the alpine group

Name and Habitat Group	FNF DEIS Status	Federal Status¹	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Erigeron lackschewitzii Lackschewitz' Fleabane	Not SCC	Sensitive	_	G3 S3	Open, gravelly, calcareous soil and talus on ridgetops in the alpine and subalpine zones.
Potentilla quinquefolia Five-leaf Cinquefoil	Not SCC	Sensitive	_	G5G4 S3	Dry, gravelly soil of exposed ridges and slopes in the montane to alpine zones.
Pinus albicaulis Whitebark pine	Not SCC	USFWS candidate	_	_	High elevation forested areas in central and western Montana; upper montane near treeline

- 1. Species previously listed as sensitive by the Regional Forester as of January 2016. USFWS threatened and endangered, proposed, or candidate species 4/20/2016 listing.
- 2. Montana Natural Heritage Program state status species of concern (SOC) and Global (G1-5) and State (S1-5) species rankings.

Table D-9. Plant species, species status, and habitat associations for the mesic montane, disturbance, rock/talus/scree group

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank <sup>2</sup>	Habitat
Botrychium ascendens Upward-lobed Moonwort	Not SCC	Sensitive	SOC	G3 S3	Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats.
Botrychium crenulatum Wavy Moonwort	Not SCC	Sensitive	_	G3 S3	Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats. Sites may be partially shaded or open.
Botrychium hesperium Western Moonwort	Not SCC	Sensitive	_	G4 S3	Various dry to mesic sites from valley bottoms to the subalpine, including roadsides and other disturbed habitats.
Botrychium paradoxum Peculiar Moonwort	SCC	Sensitive	_	G3G4 S3	Mesic meadows associated with spruce and lodgepole pine forests in the montane and subalpine zones; also found in springy western red cedar forests.

Name and Habitat Group	FNF DEIS Status	Federal Status <sup>1</sup>	State Status <sup>2</sup>	Global/State Rank²	Habitat
Botrychium pedunculosum Stalked Moonwort	SCC	Sensitive	_	G2G3 S2	Various mesic sites from valley bottoms to the montane zone. The most common habitats are western red cedar bottomlands.
Collema curtisporum Jelly Lichen	SCC	Sensitive	_	G3 S1	Moist riparian forests, often in narrow sheltered valleys.  Substate: Trunk (bark) of <i>Populus trichocarpa</i> ; occasionally on conifer twigs.
Corydalis sempervirens Pale Corydalis	SCC	Sensitive	_	G4G5 S2	Montane; rocky, disturbed or eroding soil of steep slopes in open forest, often appearing after fire.
Cypripedium fasciculatum Clustered Lady's-slipper	SCC	Sensitive	_	G4 S2	Montana occurrences are mostly in warm, dry mid-seral montane forest in the Douglas fir/ninebark and grand fir/ninebark habitat types.
Grimmia brittoniae Britton's dry rock moss	SCC	Sensitive	soc	G2 S2	Shaded cliff face
Grindelia howellii Howell's Gumweed	SCC	Sensitive	_	G3 S2S3	Vernally moist, lightly disturbed soil adjacent to ponds and marshes, as well as similar human-created habitats, such as roadsides and grazed pastures.
Idahoa scapigera Scalepod	SCC	Sensitive	_	G5 S1S2	Vernally moist, open soil on rock ledges in the lower montane zone.
Lathyrus bijugatus Latah Tule Pea	Not SCC	Sensitive	_	G4 S2S3	Open ponderosa pine and western larch forests in the valley and lower montane zones.
Mimulus breviflorus Short-flowered Monkeyflower	SCC	Sensitive	_	G4 S1S2	Shallow, vernally moist soil among rock outcrops in coniferous forests or grasslands in the montane zone.
Polygonum austiniae Austin's Knotweed	Not SCC	Sensitive	PSOC	G4 S3S4	Gravelly, often shale-derived soil of open slopes and banks in the montane zone.
Silence spaldingii Spalding's Campion (or catchfly)	Not SCC	USFWS Threatened	_	_	Open grasslands with rough fescue or bluebunch wheatgrass

<sup>1.</sup> Species previously listed as sensitive by the Regional Forester as of January 2016. USFWS threatened and endangered, proposed, or candidate species 4/20/2016 listing.

<sup>2.</sup> Montana Natural Heritage Program state status species of concern (SOC) and Global (G1-5) and State (S1-5) species rankings.

Table D-10 lists invertebrate species that occur within the diversity of habitats on the Flathead Forest. The table shows species whose range includes the Forest, but not all species are known to occur on national forest system lands (exhibit W-1). More detailed information on invertebrate characteristics, habitats, distribution, and observations is available from the Montana Natural Heritage Program and NatureServe databases.

Table D-10. Invertebrate species, species status, and habitat associations

Species Name	Species Status¹	Aquatic Wetland and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
Salmasellus steganothrix <sup>3</sup> A Cave Obligate Isopod	G2G3 S1S2		Х				
Ephydatia cooperensis <sup>3</sup> A Freshwater Sponge	G1 G3 S1 S3	Х					
Caenis youngi <sup>3</sup> A Mayfly	G4 S2	Х					
Parameletus columbiae <sup>3</sup> A Mayfly	G2 S1	X					
Rhyacophila ebria <sup>3</sup> A Rhyacophilan Caddisfly	G2G3 S1	Х					
Rhyacophila gemona <sup>3</sup> A Rhyacophilan Caddisfly	G2G3 S2	Х					
Rhyacophila glacier³ A Rhyacophilan Caddisfly	G3 S1	Х					
Rhyacophila potteri <sup>3</sup> A Rhyacophilan Caddisfly	G3 S2	Х					
Rhyacophila rickeri <sup>3</sup> A Rhyacophilan Caddisfly	G3G4 S2	Х					
<i>Isocapnia crinite</i> <sup>3</sup> A Stonefly	G4 S2	X					
Stygobromus tritus² A Subterranean Amphipod	G1G2 S1S2	X					
<i>Boloria alberta</i> <sup>3</sup> Alberta Fritillary	G3 S2 S3			Х			Х

Species Name	Species Status¹	Aquatic Wetland and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
<i>Isocapnia integra</i> <sup>3</sup> Alberta Snowfly	G4 S2	X					
Rhyacophila alexanderi <sup>3</sup> Alexander's Rhyacophilan Caddisfly	G2 S2	Х					
<i>Oreohelix alpina</i> Alpine Mountainsnail	G1 S1			X			X
Agapetus montanus³ An Agapetus Caddisfly	G3 S3	Х					
Oreohelix amariradix <sup>3</sup> Bitterroot Mountainsnail	G1G2 S1S2			Х		Х	
Aeshna tuberculifera Black-tipped Darner	G4S2S4	Х					
Rhionaeschna multicolor Blue-eyed Darner	G5S2S4	Х					
Leucorrhinia borealis <sup>3</sup> Boreal Whiteface	G5 S1	Х					
Somatochlora walshii Brush-tipped Emerald	G5 S1S2	Х					
Oreohelix elrodi Carinate Mountainsnail	G1 S1,			Х	Х		
Soliperla salish³ Clearwater Roachfly	G2 S2	Х					
<i>Utacapnia Columbiana</i> <sup>3</sup> Columbian Snowfly	G4 S2	Х					
Zapada cordillera <sup>3</sup> Cordilleran Forestfly	G3 S2	Х					
<i>Boloria frigga</i> <sup>3</sup> Frigga Fritillary	G5 S1 S2	Х					

Species Name	Species Status <sup>1</sup>	Aquatic Wetland and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
Euphydryas gillettii Gillette's Checkerspot	G3 S2	X			Х	Х	
<i>Stygobromus glacialis</i> <sup>3</sup> Glacier Amphipod	G1G3 S1S2	X					
<i>Polygonia progne</i> <sup>3</sup> Gray Comma	G4G5 S2	Х			Х		
Polygyrella polygyrella <sup>3</sup> Humped Coin	G3 S1S2,			Х	Х		
Oreohelix carinifera <sup>3</sup> Keeled Mountainsnail	G1 S1			Х			
Discus brunsoni <sup>3</sup> Lake Disc	G1 S1,			Х			
Physa Physa megalochlamys <sup>3</sup> Large-mantle Physa	G3G4 S1	Х					
Caurinella idahoensis <sup>3</sup> Lolo Mayfly	G3 S2	Х					
O <i>reohelix haydeni<sup>3</sup></i> Lyrate Mountainsnail	G2G3 S1S3			Х			
<i>Magnipelta mycophaga</i> <sup>3</sup> Magnum Mantleslug	G3 S2S3	Х		Х	Х		
<i>Hemphillia danielsi</i> <sup>3</sup> Marbled Jumping-slug	G2 G3 S1 S2	Х		Х	Х		
<i>Lednia tumana</i> Meltwater Lednian Stonefly	G1 G2 S1, Candidate	Х					
Goereilla baumanni <sup>3</sup> Northern Rocky Mountains Refugium Caddisfly	G2 S2	Х					
Rossiana Montana <sup>3</sup> Northern Rocky Mountains Refugium Caddisfly	G2G3 S2	Х					

Species Name	Species Status¹	Aquatic Wetland and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
Sericostriata surdickae <sup>3</sup> Northern Rocky Mountains Refugium Caddisfly	G3 S3	Х					
Caudatella edmundsi <sup>3</sup> Northern Rocky Mountains Refugium Mayfly	G3 G4 S3	Х					
Ocellated Emerald Somatochlora minor	G5S2S4	Х					
<i>Hemphillia camelus</i> <sup>3</sup> Pale Jumping-slug	G4 S1	Х					
<i>Kootenaia burkei</i> <sup>3</sup> Pygmy Slug	G2 S1S2	Х			Х		
Red-veined meadowhawk Sympetrum madidum	G4S2S3	Х					
Prophysaon andersoni <sup>3</sup> Reticulate Taildropper	G5 S1S2	Х			Х		
Haplotrema vancouverense <sup>3</sup> Robust Lancetooth	G5 S1 S2				Х		
Acroloxus coloradensis <sup>3</sup> Rocky Mountain Capshell	G3 S1	Х					
Colligyrus greggi <sup>3</sup> Rocky Mountain Duskysnail	G4 S1	Х					
Soyedina potteri <sup>3</sup> Northern Rocky Mountains Refugium Stonefly	G2 S2	Х					
Zacoleus idahoensis³ Sheathed Slug	G3G4 S2S3,			Х	Х		
Pristiloma wascoense <sup>3</sup> Shiny Tightcoil	G3 S1S3			Х	Х		
<i>Prophysaon humile</i> Smoky Taildropper	G3 S2S3	X		Х	Х		

Species Name	Species Status¹	Aquatic Wetland and/or Riparian	Caves and Springs	Rock/Talus/ Scree	Woodland	Open Meadow	Alpine
Isoperla petersoni <sup>3</sup> Springs Stripetail	G5 S2	Х					
Discus shimekii <sup>3</sup> Striate Disc	G5 S1				Х		
Coenagrion interrogatum <sup>3</sup> Subarctic Bluet	G5 S1 S2	Х					
Aeshna subarctica Subarctic Darner	G5 S1 S2	Х					
Zapada glacier <sup>3</sup> Western Glacier Stonefly	G1 S1	Х					
Margaritifera falcata <sup>2, 3</sup> Western Pearlshell	G4G5 S2	Х					

<sup>1.</sup> USFWS threatened, endangered, proposed, or candidate species (4/20/2016), Montana Natural Heritage Program Global (G1-5) and State (S1-5) ranking. Species of conservation concern (SCC) listed by the Regional Forester (as of May 2016).

Table D-11 lists aquatic vertebrate species, their species status, shows if they are found in lentic, lotic, or fished habitats.

Table D-11. Aquatic vertebrate species, species status, and habitat associations

Species Name	Lentic <sup>1</sup>	Lotic <sup>2</sup>	Fished	Species Status <sup>3</sup>
Thymallus arcticus Arctic Grayling	X		Х	G5-S1 Non-native
Salvelinus confluentus Bull trout	X	Х	Х	G4 S2 Threatened
Salvelinus fontinalis Brook Trout	X	Х	Х	G5 SNA Non-native
Oncorhynchus mykiss Rainbow Trout	X	X	Х	G5 S5 Non-native

<sup>2.</sup> Previously listed as a sensitive species on the Forest (Regional Forester 2011).

<sup>3.</sup> Not known to occur on NFS lands.

Species Name	Lentic <sup>1</sup>	Lotic <sup>2</sup>	Fished	Species Status <sup>3</sup>
Oncorhynchus clarkii lewisi	Х	Х	X	G4T3 S2
Westslope Cutthroat trout				FNF SCC
Cottus cognatus	X	X		G5 S5
Slimy Sculpin				Native
Cottus bondi		X		GNR SNR
Rocky Mountain Sculpin				Native
Richardsonius balteatus	X	X		G5 S5
Redside Shiner				Native
Prosopium coulterii	X			G5 S3
Pygmy Whitefish				Native
Prosopium williamsoni	X	X	Х	G5 S5
Mountain Whitefish				Native
Catostomus macrocheilus	X	X		G5 S5
Largescale sucker				Native
Catostomus catostomus	X	X		G5 S5
Longnose sucker				Native
Mylocheilus caurinus	X			G5 S5
Peamouth chub				Native
Ptychocheilus oregonensis	X			G5 S5
Northern Pikeminow				Native
Salvelinus namaycush	X		X	G5 SNA
Lake trout				Non-native
Esox Lucius	X	Х	X	G5 S5
Northern Pike				Non-native
Perca flavescens	X		X	G5 SNA
Yellow Perch				Non-native
Sander vitreus	Х		X	G5 SNA
Walleye				Non-native
Oncorhynchus nerka	X		X	G5-SNA
Kokanee Salmon				Non-native
Micropterus salmoides	Х		X	G5 SNA
Largemouth Bass				Non-native

Species Name	Lentic <sup>1</sup>	Lotic <sup>2</sup>	Fished	Species Status <sup>3</sup>
Lepomis gibbosus	X			G5 SNA
Pumkinseed				Non-native
Micropterus dolomieu	X		X	G5 SNA
Smallmouth Bass				Non-naive

- 1. Inhabiting, or situated in still, fresh water.
- 2. Inhabiting, or situated in rapidly moving fresh water.
- 3. Threatened and endangered, proposed, or candidate species (4/20/2016), Montana Natural Heritage Program Global (G1-5) and State (S1-5) species (2013) ranking; species with a global or state rank of 1 or 2, and the Regional Forester's species of conservation concern (SCC) as of April 2016; non-native species of interest. There are other fish that occur on the forest, however they are not listed since they do not fall into one of the above categories.

### **Appendix E: Watershed Condition Framework and Conservation Watershed Network**

#### **Table of Contents**

Introduction	E-1
Watershed Condition Framework	E-1
Total Maximum Daily Loads	E-3
Conservation Watershed Network for Native Fish	E-7
Multi-scale Analysis	E-8
Summary of Conservation Watershed Network Multi-Scale Analysis	E-11
Basin and greater scale	
Sub-basin/ Core Area Scale	
Watershed /Sub-watershed/ Local Population Scale	E-12
List of Tables	
Table E-1. Watershed Condition Framework class 2 watersheds on the Flathead National Fo	orest E-5

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#### Introduction

One of the original purposes for establishing the National Forest System was to protect our Nation's water resources. The 2012 planning rule includes a newly created set of requirements associated with maintaining and restoring watersheds and aquatic ecosystems, water resources, and riparian areas in the plan area. The increased focus on watersheds and water resources in the 2012 planning rule reflects the importance of this natural resource, and the commitment to stewardship of our waters.

The 2012 planning rule requires that plans identify watersheds that are a priority for restoration and maintenance. The 2012 planning rule requires all plans to include components to maintain or restore the structure, function, composition, and connectivity of aquatic ecosystems and watersheds in the plan area, taking into account potential stressors, including climate change, how they might affect ecosystem and watershed health and resilience. Plans are required to include components to maintain or restore water quality and water resources, including public water supplies, groundwater, lakes, streams, wetlands, and other bodies of water. The planning rule requires that the Forest Service establish best management practices for water quality, and that plans ensure implementation of those practices.

Plans are also required to include direction to maintain and restore the ecological integrity of riparian areas. The Flathead National Forest proposes to maintain riparian areas through riparian habitat conservation areas and standards and guidelines. This direction will also protect native fish and further strengthen the Watershed Conservation Network.

#### **Watershed Condition Framework**

The watershed condition framework will be used to identify priority watersheds, develop watershed action plans, and implement projects to maintain or restore conditions in priority watersheds.

Priority areas for potential restoration activities could change quickly because of events such as wildfire or the introduction of invasive species. Therefore, the 2012 planning rule includes priority watersheds as plan content, so that an administrative change could be used to quickly respond to changes in priority.

Benefits from implementing the watershed condition framework are as follows:

- Strengthens the effectiveness of Forest Service watershed restoration
- Establishes a consistent, comparable, credible process for determining watershed condition class
- Enables a priority-based approach for the allocation of resources for restoration
- Improves Forest Service reporting and tracking of watershed condition
- Enhances coordination with external agencies and partners.

The Forest Service Manual 2520, Watershed and Air Management, uses three classes to describe watershed condition:

- Class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

• Class 3 watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

The Forest Service Manual classification defines watershed condition in terms of "geomorphic, hydrologic and biotic integrity" relative to "potential natural condition." Geomorphic functionality or integrity can be defined in terms of attributes such as slope stability, soil erosion, channel morphology, and other upslope, riparian, and aquatic habitat characteristics. Hydrologic functionality or integrity relates primarily to flow, sediment, and water-quality attributes. Biological functionality or integrity is defined by the characteristics that influence the diversity and abundance of aquatic species, terrestrial vegetation, and soil productivity.

In each case, integrity is evaluated in the context of the natural disturbance regime, geoclimatic setting, and other important factors within the context of a watershed. The definition encompasses both aquatic and terrestrial components, because water quality and aquatic habitat are inseparably related to the integrity and, therefore, the functionality of upland and riparian areas within a watershed. The three watershed condition classes are directly related to the degree or level of watershed functionality or integrity:

- Class 1 = Functioning Properly
- Class 2 = Functioning at Risk
- Class 3 = Impaired Function.

In this framework, a watershed is considered in good condition if it is functioning in a manner similar to one found in natural wildland conditions.<sup>1, 2</sup> This characterization should not be interpreted to mean that managed watersheds cannot be in good condition. A watershed is considered to be functioning properly if the physical attributes are appropriate to maintain or improve biological integrity. This consideration implies that a class 1 watershed in properly functioning condition has minimal undesirable human impact on natural, physical, or biological processes and is resilient and able to recover to the desired condition when or if disturbed by large natural disturbances or land management activities.<sup>3</sup> By contrast, a class 3 watershed has impaired function because some physical, hydrological, or biological threshold has been exceeded. Substantial changes to the factors that caused the degraded state are commonly needed to set them on a trend or trajectory of improving conditions that sustain physical, hydrological, and biological integrity. Defining specific classes for watershed condition is obviously subjective and, therefore, problematic for several reasons. First, watershed condition is not directly observable. In nature, no distinct lines separate a watershed that is functioning properly from impaired condition, and every classification scheme is arbitrary to some extent. Second, watershed condition is a mental construct that has numerous definitions and interpretations in the scientific literature.<sup>5</sup> Third, the attributes that reflect the state of a watershed are continually changing because of natural disturbances (e.g., wildfire, landslides, floods, insects, and disease), natural variability of ecological processes (e.g., flows and cycles of energy, nutrients, and water), climate variability and change, and human modifications.

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<sup>&</sup>lt;sup>1</sup> Karr, J.R. and L.W. Chu. 1999. *Restoring life in running rivers: better biological monitoring*. Washington, DC: Island Press. 206 p.

<sup>&</sup>lt;sup>2</sup> Lackey, R.T. 2001. "Values, policy, and ecosystem health." *Bioscience* 51: 437–443.

<sup>&</sup>lt;sup>3</sup> Yount, J.D. and G.J. Niemi. 1990. "Recovery of lotic communities and ecosystems from disturbance—a narrative case study." *Environmental Management* 14: 547–570.

<sup>&</sup>lt;sup>4</sup> Suter, G.W. 1993. "Critique of ecosystem health concepts and indexes." *Environmental Toxicology and Chemistry* 12: 1533–1539.

<sup>&</sup>lt;sup>5</sup> Lackey, R.T. 2001. "Values, policy, and ecosystem health." *Bioscience* 51: 437–443.

The Flathead National Forest completed our watershed condition framework in 2011. The Forest Service identified five class 2 hydrologic unit code (HUC) 12 watersheds and 176 class 1 hydrologic unit code 12 watersheds. There were no class 3 watersheds identified. Table E-1identifies the class 2, Functioning at Risk, watersheds and their priority for restoration. Figure B-06 shows the locations of the class 2 watersheds.

Cold and Jim creeks are the highest priority for restoration because they are important bull trout streams in the Swan River drainage. Beaver, Meadow and Logan are predominantly brook trout streams and although it is desirable to move these watersheds to a class 1, it would be a wiser investment to prioritize restoration work in the Conservation Watershed Network for native fish as described below.

The watershed condition framework is one component of our aquatic conservation strategy and is designed to restore watersheds to their natural potential condition. These watersheds require short-term investments to restore them. Another component is to restore impaired waterbodies on the state 303(d) list that have completed total maximum daily loads (also referred to as TMDLs). These watersheds would also require short-term investments. The final component in the strategy is the Conservation Watershed Network, which is designed to provide long-term protection, connectivity, and survival of native fish.

#### **Total Maximum Daily Loads**

The Montana Water Quality Act requires the Montana Department of Environmental Quality to develop TMDLs for streams and lakes that do not meet, or are not expected to meet, Montana water quality standards. The Montana Department of Environmental Quality submits the TMDLs to the U.S. Environmental Protection Agency for approval. A TMDL is the maximum amount of a pollutant a waterbody can receive and still meet water quality standards. Total maximum daily loads provide an approach to improve water quality so that streams and lakes can support and maintain their state-designated beneficial uses.

An indication of the quality of stream habitat and water quality on the Flathead National Forest can be derived from the TMDL determination and 303(d) listing process. In 1996, the year after the implementation of *Inland Native Fish Strategy*<sup>6</sup> (INFISH), there were 22 streams on the forest that were listed as impaired due to siltation. During the TMDL development for streams on the forest from 2004 to 2014, no TMDL was required for 17 of those streams because data collected to support TMDL development indicated that they were no longer impaired for sediment and were removed from the 303(d) list without a required TMDL. In other words sediment, which was leading factor toward impairment, was no longer impacting beneficial uses.

On the Flathead National Forest, the Montana Department of Environmental Quality determined that sediment continues to impair aquatic life in Logan, Sheppard, Coal, Goat, and Jim creeks, and the Department provided sediment TMDLs for those waterbody segments. Therefore, TMDLs have been developed for all streams on the Forest where required. Three waterbodies that are downstream of our Forest boundary, Swan Lake, Haskill Creek, and the Stillwater River, also have sediment TMDLs that

<sup>9</sup> Ibid.

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<sup>&</sup>lt;sup>6</sup> USDA. 1995. Inland Native Fish Strategy: Environmental Assessment—Decision Notice and Finding of No Significant Impact. "Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada." USDA, Forest Service. Intermountain, Northern, and Pacific Northwest Regions. 211 pp.

<sup>&</sup>lt;sup>7</sup> Montana Department of Environmental Quality. 2014. *Montana 2014 Final Water Quality Integrated Report*. Helena, Montana.

<sup>&</sup>lt;sup>8</sup> Ibid.

have been developed. Fish Creek is a recent example of a stream that was on the 1996 303(d) list and continued through the 2014 303(d) list for sediment impairment, but data collected to support TMDL development in 2014 indicated that it is no longer impaired for sediment and will be removed from the 303(d) list.<sup>10</sup>

For the five streams with sediment TMDLs, excess sediment may be limiting their ability to support aquatic life. Water quality restoration goals for sediment were established on the basis of fine sediment levels in trout spawning areas and aquatic insect habitat, stream morphology and available in-stream habitat as it related to the effects of sediment, and the stability of streambanks. The Montana Department of Environmental Quality believes that once these water quality goals are met, all water uses currently affected by sediment will be restored. The Department's water quality assessment methods for sediment impairment are designed to evaluate the most sensitive use; thus, ensuring protection of all designated uses. For streams in western Montana, the most sensitive use assessed for sediment is aquatic life.

Three of the five impaired streams (Coal, Goat and Jim creeks) are important bull trout streams and Sheppard Creek supports a pure westslope cutthroat trout population that competes with brook trout. Restoration efforts in these watersheds will focus on reducing sediment levels through best management practices for roads and reduction of roads.

<sup>10</sup> Montana Department of Environmental Quality. 2014. *Montana 2014 Final Water Quality Integrated Report*. Helena, Montana.

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Table E-1. Watershed Condition Framework class 2 watersheds on the Flathead National Forest

Current Priority Level	Watershed Name	Attributes Rated at Risk in Watershed Condition Framework Assessment	Current Planning Efforts	Overlapping Priorities and Partnerships	Notes
High	Cold Creek	Riparian/wetlands, road density, best management practices (BMPs), soil productivity	Chilly James. Scoped in February 2014	SW Crown Collaborative Forest Landscape Restoration Program (CFLRP), Bull Trout Cons Strategy Priority Watershed	Cold Ponds Wetland Restoration Project, Bull trout Conservation Strategy Watershed. Bull trout numbers are decreasing due to lake trout in Swan Lake.
High	Jim Creek	303(d) listed stream, riparian/wetlands, soil productivity, road density, functioning at risk condition class (FRCC), weeds	Chilly James. Scoped in February 2014	SW Crown CFLRP, Bull Trout Conservation Strategy Priority Watershed, Swan Total Maximum Daily Load Tech Advisory Group.	Bull trout numbers are decreasing due to lake trout in Swan Lake. Opportunity for riparian/wetland restoration and weed treatments. No in-stream fish habitat restoration needs identified 303(d) listing resulting from historic logging practices and poor road conditions.
High	Beaver Creek	Road density, BMPs, weeds, insects and disease, non-native fish	Beaver Creek. Proposed Action March 2014	SW Crown CFLRP	Opportunities to slow non-native fish invasion and reduce road density.
High	Meadow Creek	Channel morphology, riparian/wetlands, water quality, non-native species	Griffin Creek II Decision. December 2013	Montana Fish Wildlife & Parks	Opportunities to restore riparian conditions and water quality in Meadow Creek. Riparian fencing followed by large-scale willow planting. Remove lodgepole pine encroachment. Establish beaver populations.
Moderate	Middle Logan	303(d) listed stream, non-native fish, road density, riparian/wetlands, FRCC, water quality	None	Montana Fish Wildlife & Parks	Logan Creek road relocation, Sanko Creek cutthroat restoration, road treatments into gravel pit.

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#### **Conservation Watershed Network for Native Fish**

A Conservation Watershed Network (figure B-07) is a collection of watersheds where management emphasizes habitat conservation and restoration to support native fish and other aquatic species. The goal of the network is to sustain the integrity of key aquatic habitats to maintain long-term persistence of native aquatic species. Designation of Conservation Watershed Networks, which should include watersheds that are already in good condition or could be restored to good condition, are expected to protect native fish and help maintain healthy watersheds and river systems. Selection criteria for inclusion should help identify those watersheds that have the capability to be more resilient to ecological change and disturbance induced by climate change. For example, watersheds containing unaltered riparian vegetation will tend to protect streambank integrity and moderate the effects of high stream flows. Rivers with high connectivity and access to their flood-plains will experience moderated floods when compared to channelized and disconnected stream systems. Wetlands with intact natural processes slowly release stored water during summer dry periods, whereas impaired wetlands are likely less effective retaining and releasing water over the season. For all of these reasons, Conservation Watershed Networks represent the best long-term conservation strategy for native fishes and their habitats.

Many watersheds on the forest that support the healthiest populations of native trout already have their headwaters protected through lands managed as Congressionally-designated wilderness areas (Bob Marshall, Great Bear and Mission Mountain Wildernesses) or the Flathead's wild and scenic rivers. These special places are the building blocks of a conservation network as naturally functioning headwaters have a large influence on the function of downstream stream reaches. <sup>11, 12</sup>

Of the native aquatic species present in the plan area, bull trout depend on the largest connected habitat areas, often called habitat patches. The definition we use for the term "habitat patch" as it relates to bull trout is defined by Rieman and McIntyre, <sup>13</sup> "contiguous stream areas believed suitable for spawning and rearing." Some potential fish conservation areas may be more challenging to conserve if the habitat patches are small and disconnected, especially considering potential effects of climate change. <sup>14, 15, 16</sup> This is especially true for bull trout because spawning adults and juveniles depend on large areas of connected stream reaches with cold water less than 11 degrees centigrade in late summer months, and often tens of thousands of acres in size.

Bull trout habitat in the western United States is naturally patchy, and can be fragmented into smaller less suitable habitat patches by warming stream reach segments. <sup>17</sup> The modeling performed by Isaak and

<sup>&</sup>lt;sup>11</sup> Allan, J.D., D.L. Erickson and J. Fay. 1997. "The influence of catchment land use on stream integrity across multiple spatial scales." *Freshwater Biology* 37: 149–161.

<sup>&</sup>lt;sup>12</sup> Feld, C.K. and C.W. Lorenz. 2013. "Upstream river morphology and riparian land use overrule local restoration effects on ecological status assessment." *Hydrobiologia* 704: 489–501.

<sup>&</sup>lt;sup>13</sup> Rieman, B.E. and J.D. McIntyre. 1995. "Occurrence of bull trout in naturally fragmented habitat patches of varied size." *Transactions of the American Fisheries Society* 124 (3): 285–296.

<sup>14</sup> Ibid.

<sup>&</sup>lt;sup>15</sup> Dunham, J.B., B.E. Rieman, and J. Peterson. 2002. "Patch-based models to predict species occurrence- Lessons from salmonid fishes in streams" *In* Scott, J.M., P. Heglund, M. Morrison, J. Haufler, and B. Wall, eds., *Predicting Species Occurrences: Issues of scale and accuracy*: Covela, CA, Island Press, pp. 327–334.

<sup>&</sup>lt;sup>16</sup> Rieman, B.E., D. Isaak, S. Adams, D. Horan, D. Nagel, C. Luce and D. Myers. 2007. "Anticipated climate warming effects on bull trout habitats and populations across the interior Columbia River basin." *Transactions of the American Fisheries Society* 136 (6): 1552–1565.

<sup>&</sup>lt;sup>17</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.

others <sup>18</sup> assigns a probability of occupancy for bull trout and westslope cutthroat trout based upon cold water habitats (< 11°C), stream slope, and brook trout prevalence. The model looks at a baseline period from 1970–1999 referred to in the paper as 1980, and then predicts changes habitat patches for the future periods 2040 and 2080. Modelled warming is based on 10 global climate change models. Figure B-58 displays the distribution of cold water habitats with occupancy probabilities for bull trout on the Flathead National Forest in 1980 and 2040. Figure B-59 displays the distribution of cold water habitats with occupancy probabilities for westslope cutthroat trout in 1980 and 2040, respectively. Many cold water patches are predicted to exist for both species along the Continental Divide. Many more patches exist for westslope cutthroat trout in the model when compared to bull trout because they persist in smaller patches. In a recently published paper by Isaak and others, <sup>19</sup> the researchers refined predictions for water temperature changes, which effects patch size and probabilities of persistence in 2040. The moderate scenario prediction for 2040 in their 2015 paper could now be considered a more extreme prediction and is unlikely to occur until decades later.

Considering studies about patch size and climate effects on patch size, identifying large habitat patch areas, typically 5th code watersheds with known stable local populations of bull trout form the basis of identifying a conservation watershed network for the Flathead Plan Revision. Because so much of the habitat in the Columbia Headwaters Recovery Unit<sup>20</sup> is fragmented by natural barriers, as well as by numerous dams constructed for power and water use, a goal in identifying the Conservation Watershed Network is identifying multiple adjacent 5th code watersheds, including watersheds with some risk of damage from the effects of changing climate. Watersheds that would benefit from storm-proofing treatments (a strategy to help protect watersheds from climate change discussed in appendix C) are identified in FW-CWN-OBJ-01. Simply stated, the larger a functioning and connected habitat patch, the greater the chances that cold water dependent bull trout and westslope cutthroat populations are likely to persist. It's important to note here that even in smaller habitat patches, standards and guidelines proposed in this revision in combination with delineated riparian management zones are expected to maintain and improve existing habitat conditions for these smaller patches, even when not included in the Conservation Watershed Network.

#### Multi-scale Analysis

Multi-scale analysis was used to develop the Forest's Conservation Watershed Network, starting with the scale of the Columbia River Basin. The best available science indicates the Flathead is and will be important for conservation of native fish (bull trout and westslope cutthroat trout) across their range. <sup>21, 22, 23, 24</sup> The Flathead River basin is along the spine of the continent and is predicted to provide

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 <sup>&</sup>lt;sup>18</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.
 <sup>19</sup> Isaak, D., M. Young, C. Luce, S. Hostetler, S. Wenger, E. Peterson, J. Ver Hoef, M. Groce, D. Horan and D. Nagel. 2016. "Slow climate velocities of mountain streams portend their role as refugia for cold-water biodiversity." *Proceedings of the National Academy of Sciences*. doi:10.1073/pnas.1522429113.
 <sup>20</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>21</sup> Ibid.

<sup>&</sup>lt;sup>22</sup> Isaak, D., M. Young, D. Nagel, D. Horan, and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553. <sup>23</sup> Shepard, B.B., B.E. May, and W. Urie. 2005. "Status and conservation of westslope cutthroat trout within the western United States." *North American Journal of Fisheries Management* 25 (4): 1426–1440.

<sup>&</sup>lt;sup>24</sup> Muhlfeld, C.C., T.E. McMahon, M.C. Boyer and R.E. Gresswell. 2009. "Local habitat, watershed, and biotic factors influencing the spread of hybridization between native Westslope Cutthroat Trout and introduced Rainbow Trout." *Transactions of the American Fisheries Society* 138:1036–1051.

cold water into the future due to high elevation and slow climate velocities of mountain streams.<sup>25</sup> We then looked at the climate shield model<sup>26</sup> and temperature model<sup>27</sup> across the Flathead River basin (6th hydrologic unit code) to look closer where cold water is predicted to persist into the future in the face of climate change. The models both identified that cold water is predicted to persist in many of our local bull trout populations that were previously identified as priority watersheds under INFISH.<sup>28</sup> Therefore, we carried over our priority bull trout watersheds and those watersheds designated as critical habitat by the USFWS<sup>29</sup> into our network.

The forest also needed to take a closer scale look at our westslope cutthroat trout populations at the subbasin level (8th hydrologic unit code). There are many pure populations of westslope cutthroat trout on the forest, unlike many other watersheds across their range where brook trout have either outcompeted them or rainbow trout have hybridized with them. The South Fork Flathead River subbasin is extremely unique for its size in that there are no brook trout or rainbow trout populations above Hungry Horse Dam. The large patch size, proximity to each other, and connectivity (10th and 12th field hydrologic unit code scale) of these populations makes conservation important, as throughout westslope cutthroat trout range, only small fragmented populations exist.<sup>30, 31</sup>

Lastly, the Forest identified two 12th field hydrologic unit codes in each 8th field hydrologic unit code where storm-proofing would be targeted in the first decade of the plan. Reach scale data, barriers and road data were used to identify watershed for restoration priority while integrating terrestrial restoration priorities for grizzly bear, for example. See appendix C, for an additional description and an example of multi-scale analysis.

Multi-scale analysis is consistent with guidance contained in the Interior Columbia Basin Ecosystem Management Project memorandum of understanding<sup>32</sup> approved by senior managers in several of the western federal land management and regulatory agencies (i.e., Environmental Protection Agency, National Marine Fisheries Service, USFWS, Bureau of Land Management, and the USFS). The memorandum updated science findings from the original Interior Columbia Basin Ecosystem Management Project effort of the late 1990s and guides inclusion of best available science into land management plan revisions.

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<sup>&</sup>lt;sup>25</sup> Isaak, D., M. Young, C. Luce, S. Hostetler, S. Wenger, E. Peterson, J. Ver Hoef, M. Groce, D. Horan and D. Nagel. 2016. "Slow climate velocities of mountain streams portend their role as refugia for cold-water biodiversity." *Proceedings of the National Academy of Sciences*. doi:10.1073/pnas.1522429113.

<sup>&</sup>lt;sup>26</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.

<sup>&</sup>lt;sup>27</sup> Jones, L.A., C.C. Muhlfeld, L.A. Marshall, B.L. McGlynn and J.L. Kershner. 2014. "Estimating thermal regimes of bull trout and assessing the potential effects of climate warming on critical habitats." *River Research and Applications* 30: 204–216. doi: 10.1002/rra.2638.

<sup>&</sup>lt;sup>28</sup> USDA. 1995. Inland Native Fish Strategy: Environmental Assessment—Decision Notice and Finding of No Significant Impact. "Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada." USDA, Forest Service. Intermountain, Northern, and Pacific Northwest Regions. 211 pp.

<sup>&</sup>lt;sup>29</sup> USFWS. 2010. Endangered and threatened wildlife and plants; revised designation of critical habitat for bull trout in the coterminous United States; final rule. October 18, 2010. *Federal Register* 75:63898-64070.

<sup>&</sup>lt;sup>30</sup> Rieman, B.E. and J.D. McIntyre. 1995. "Occurrence of bull trout in naturally fragmented habitat patches of varied size." *Transactions of the American Fisheries Society* 124 (3): 285–296.

<sup>&</sup>lt;sup>31</sup> Shepard, B.B., B.E. May and W. Urie. 2005. "Status and conservation of westslope cutthroat trout within the western United States." *North American Journal of Fisheries Management* 25 (4): 1426–1440.

<sup>&</sup>lt;sup>32</sup> USDA. 2014. The Interior Columbia Basin Strategy, Interagency Memorandum of Understanding. A strategy for applying knowledge gained by the Interior Columbia Basin Ecosystem Management Project to the revision of land use plans and project implementation. Forest Service Agreement No. 03-RMU-11046000-007. 6 pp.

At the broadest of scale considerations, information in USFWS's bull trout recovery plan<sup>33</sup> was reviewed to help place habitat and core populations located within the Flathead National Forest in context with recovery needs of the species across its range in the western United States. For recovery units like the Columbia Headwaters, the Recovery Plan Strategy states, "A viable recovery unit should demonstrate that the three primary principles of biodiversity have been met: representation (conserving the breadth of the genetic makeup of the species to conserve its adaptive capabilities); resilience (ensuring that each population is sufficiently large to withstand stochastic events); and redundancy (ensuring a sufficient number of populations to provide a margin of safety for the species to withstand catastrophic events<sup>34</sup>).

Additional information contained in the *Columbia Headwaters Recovery Unit Implementation Plan*, <sup>35</sup> was also reviewed. Types of information contained in the two USFWS documents included threats directly influencing individual bull trout survival, as well as threats to habitat. Primary threats were broken into different categories: habitat, demographic, and invasive species. The Flathead does not have habitat listed as a primary threat with the exception of simple core areas, Whitefish Lake and Upper Whitefish Lake. Primary threats listed throughout the rest of the Flathead Basin are demographic and invasive species. Hungry Horse does not have primary threats listed. Recovery actions for the Flathead focus on fish management and invasive species removal to help recover bull trout in the Columbia Headwaters recovery unit. In addition to primary threats, the recovery plan also recommends actions should be pursued to help provide resilience to "difficult to-manage-threats such as climate change." <sup>36</sup>

After USFWS recovery planning documents were reviewed, temperature and probability of cutthroat and bull trout occurrence data collected by Isaak and others<sup>37</sup> was reviewed by Flathead National Forest biologists to compare modeled results to known habitat conditions as well as local fish population information. Bull trout redd count data collected over the past two decades, which can be found in the bull trout section in the draft environmental impact statement, was used by biologists to help understand and validate probability of occurrence data.

Information from Isaak and others<sup>38</sup> was also considered in conjunction with PACFISH/INFISH biological opinion (PIBO) monitoring strategy data. PIBO data has been collected on the Flathead National Forest since 2000 and was used to help identify which watersheds considered for inclusion in the Watershed Conservation Network could be prioritized for potential project work to help protect habitat conditions from the effects of climate change. As the list of watersheds identified for inclusion into the Conservation Watershed Network was refined, the *U.S. Forest Service Bull Trout Conservation Strategy*<sup>39</sup> was reviewed to further identify opportunities to increase effectiveness of the network. Prior to the release of the *USFWS Bull Trout Recovery Plan*, <sup>40</sup> the Northern Region of the Forest Service developed the *U.S. Forest Service Bull Trout Conservation Strategy*. Development of this strategy was intended to meet long-

<sup>35</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>33</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. 179 pp.

<sup>&</sup>lt;sup>34</sup> Ibid, pg 33.

<sup>&</sup>lt;sup>36</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. pg. 44.

<sup>&</sup>lt;sup>37</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.

<sup>38</sup> Ibid.

<sup>&</sup>lt;sup>39</sup> USFS. 2013. U.S. Forest Service Bull Trout Conservation Strategy, Missoula, Montana.

<sup>&</sup>lt;sup>40</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. 179 pp.

term commitments made by the INFISH strategy<sup>41</sup> to have a long-term restoration strategy for inland native fish. The *U.S. Forest Service Bull Trout Conservation Strategy* has the following three-fold purpose for the Forest Service and USFWS:

- Provide a standard process for updating bull trout habitat and population baselines that can be documented in the consultation process
- Provide a structured assessment of fish populations and habitat conditions, stressors, needs
- Identify opportunities that will further guide the location, type, and extent of projects on NFS lands intended to conserve, restore, and ultimately contribute to bull trout recovery.

The final step in the conservation watershed network identification process compared watersheds identified for the current plan revision against priority watersheds first identified by INFISH. This step was taken to help ensure important information had not been overlooked by this effort.

#### **Summary of Conservation Watershed Network Multi-Scale Analysis**

#### Basin and greater scale

The Flathead does have strong populations of bull trout and westslope cutthroat trout as well as other native species and is expected to provide cold water refugia in the coming century. 42, 43, 44, 45, 46 The USFWS recovery plan documents identified some sub-basins in the Flathead as being especially important in the coming century as the Hungry Horse and Flathead Lake complex core population areas are predicted to maintain some of the coldest habitat to support bull trout in the entire Headwaters of the Columbia. The Headwaters of the Columbia includes the Pend Oreille, Blackfoot, Kootenai, and Clark Fork River basins as well as the Flathead. At the broadest of scales, habitat on the Flathead has been found to have heightened importance for the conservation of cold water dependent species like bull trout and westslope cutthroat in the western United States.

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<sup>&</sup>lt;sup>41</sup> USDA. 1995. Inland Native Fish Strategy: Environmental Assessment—Decision Notice and Finding of No Significant Impact. "Interim strategies for managing fish-producing watersheds in eastern Oregon and Washington, Idaho, western Montana, and portions of Nevada." USDA, Forest Service. Intermountain, Northern, and Pacific Northwest Regions. 211 pp.

<sup>&</sup>lt;sup>42</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. 179 pp.

<sup>&</sup>lt;sup>43</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

 <sup>&</sup>lt;sup>44</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.
 <sup>45</sup> Isaak, D., M. Young, C. Luce, S. Hostetler, S. Wenger, E. Peterson, J. Ver Hoef, M. Groce, D. Horan and D. Nagel. 2016. "Slow climate velocities of mountain streams portend their role as refugia for cold-water biodiversity." *Proceedings of the National Academy of Sciences*.

<sup>&</sup>lt;sup>46</sup> Shepard, B.B., B.E. May and W. Urie. 2005. "Status and conservation of westslope cutthroat trout within the western United States." *North American Journal of Fisheries Management* 25 (4): 1426–1440.

#### Sub-basin/ Core Area Scale

Dropping down in scale and going core area by core area (i.e., Hungry Horse (South Fork Flathead), Flathead Lake (North and Middle Fork Flathead), and Swan), cold water habitat patches identified by Isaak and others<sup>47</sup> were compared against bull trout redd survey data and core population areas disclosed in the bull trout recovery plan. <sup>48, 49</sup> The South Fork Flathead River sub-basins are particularly unique and the most important sub-basin on the Flathead National Forest proposed for inclusion in the Conservation Watershed Network. Two reasons support this assertion: Hungry Horse is expected to remain one of the coldest, and it does not contain lake trout. Throughout the Flathead basin, introduction of lake trout is considered by many as the most important primary threat to native fish. Hungry Horse Dam construction in 1953 prevented the spread of non-native lake trout into this drainage. <sup>50</sup> In addition, the South Fork subbasin contains genetically pure local populations of westslope cutthroat trout. The only non-native species in the Hungry Horse core area is grayling in Handkerchief Lake. Grayling are incapable of interbreeding with native trout and char, and do not outcompete native trout.

In addition to Hungry Horse, the Middle and North Fork Complex Core Area (containing two sub-basins) and the Swan sub-basin also have cold water habitat that is likely to persist in the 21st century. Both core areas also have substantial local populations of spawning migratory bull trout. The USFWS recovery planning documents <sup>51, 52</sup> consider the presence of substantial lake trout populations as the greatest primary threat for these two core areas. Other primary threats in the other Flathead core areas are small population size in disjunct lakes such as Frozen, Doctor and Cyclone lakes, and fisheries management. The North and Middle Fork complex core area and the Swan core area have been considered warranted for inclusion in Conservation Watershed Network. In summary at a sub-basin scale, the Flathead National Forest contains three of the most important core areas in headwaters of the Columbia River and these areas are expected to help bull trout withstand potential effects of climate change in the 21st century.

#### Watershed / Sub-watershed / Local Population Scale

At the finest scale of consideration, watersheds and sub-watersheds, the following data sets were used in the multi-scale analysis to identify a draft conservation network: priority watersheds originally identified by INFISH in 1995, existing spawning assessments for bull trout, Montana Fish, Wildlife and Parks' cutthroat occupancy data, patch size and temperature data contained in Isaak and others' climate shield model,<sup>53</sup> the *U.S. Forest Service Bull Trout Conservation Strategy*,<sup>54</sup> the *Columbia Headwaters Recovery* 

<sup>&</sup>lt;sup>47</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.

<sup>&</sup>lt;sup>48</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. 179 pp.

<sup>&</sup>lt;sup>49</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>50</sup> Montana Department Fish, Wildlife and Parks. 2006. South Fork Flathead Watershed Westslope Cutthroat Trout Conservation Program, Final Environmental Impact Statement. Helena, Montana. 410 pp.

<sup>&</sup>lt;sup>51</sup> USFWS. 2015. Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*). USFWS, Pacific Region. Portland, Oregon. 179 pp.

<sup>&</sup>lt;sup>52</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>53</sup> Isaak, D., M. Young, D. Nagel, D. Horan and M. Groce. 2015. "The cold-water climate shield: Delineating refugia for preserving salmonid fishes through the 21st Century." *Global Change Biology* 21:2540–2553.

<sup>&</sup>lt;sup>54</sup> USDA. 2013. U.S. Forest Service Bull Trout Conservation Strategy. Missoula, Montana.

*Unit Implementation Plan*, <sup>55</sup> and local knowledge of Flathead National Forest biologists and hydrologists. These data sets along with professional opinion were considered at the watershed (5th code) and subwatershed (6th code scales).

The *U.S. Forest Service Bull Trout Conservation Strategy*<sup>56</sup> and the *Columbia Headwaters Recovery Unit Implementation Plan*<sup>57</sup> provide synopses of factors leading to the decline of bull trout and recommendations for improvements in each local population. In general, there are no complete barriers on Flathead NFS lands that are preventing upstream migration of bull trout into spawning areas with the exception of Hungry Horse Dam. Habitat restoration efforts would focus on culvert removals or upsizing of culverts in light of a changing climate to reduce chance of failure that would reduce potential sediment inputs. Road storage and possibly segment relocation could be considered to help reduce potential sediment inputs.

For the Hungry Horse Complex Core Area, all watersheds in the South Fork Flathead subbasin were identified for inclusion into the Conservation Watershed Network. The Sullivan and Wounded Buck subwatersheds (12th hydrologic unit code) in lower South Fork sub-basin are identified as the highest priorities for storm-proofing on the Flathead National Forest under the Conservation Watershed Network objective in the Conservation Watershed Network section of the Plan.

For the Middle and North Fork Complex Core Area, the following sub-watersheds (12th hydrologic unit code) were identified for inclusion into the Conservation Watershed Network: Clack, Strawberry, Bowl, Trail, Morrison, Dolly, Schafer, Granite, Bear, and Long (Middle Fork); and Upper Whale, Lower Whale, Shorty, Read Meadow, Trail, Tuchuck, Upper Coal, Lower Coal, Southfork Upper Coal, Hallowat, Upper Big and Lower Big Creeks. The Trail subwatershed (12th hydrologic unit code) and the Whale Creek watershed (10th hydrologic unit code) in the North Fork Flathead sub-basin and the Granite and Bear creek sub-watersheds (12th hydrologic unit code) in the Middle Fork Flathead sub-basins are identified as the next four highest priorities for storm-proofing (after Sullivan and Wounded Buck) under the Conservation Watershed Network objective in the Conservation Watershed Network section of the Plan.

The following sub-watersheds (12th hydrologic unit code) in the Swan Sub-basin (8th hydrologic unit code) were identified for inclusion into the Conservation Watershed Network: the Swan River Headwaters, Holland Lake, Elk, Cold, Jim, Piper, Lion, Goat, Woodward, and Lost Creeks. The Goat and Lion creek sub-watersheds (12th hydrologic unit code) are identified as the final priorities for storm-proofing (following after subwatersheds in the South Fork, the Middle Fork, and North Fork Flathead sub-basins) under the Conservation Watershed Network objective in the Conservation Watershed Network section of the Plan. The Cold and Jim creek watersheds, in addition to being recommended for the Watershed Conservation Network, are listed in the draft Plan Revision as priority watersheds for restoration under the Watershed Condition Framework. <sup>58, 59</sup> In addition to sub-watersheds in the Swan and other sub-basins previously discussed, the Stillwater River Headwaters, Swift, and Upper Stillwater

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<sup>&</sup>lt;sup>55</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

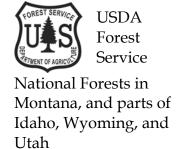
<sup>&</sup>lt;sup>56</sup> USDA. 2013. U.S. Forest Service Bull Trout Conservation Strategy. Missoula, Montana.

<sup>&</sup>lt;sup>57</sup> USFWS. 2015. Columbia Headwaters Recovery Unit Implementation Plan for bull trout (*Salvelinus confluentus*). Kalispell, Montana. 184 pp.

<sup>&</sup>lt;sup>58</sup> USDA. 2011. Forest Service watershed condition classification technical guide. Washington, DC: USDA, Forest Service. Watershed, Fish, Wildlife, Air, and Rare Plants Program.

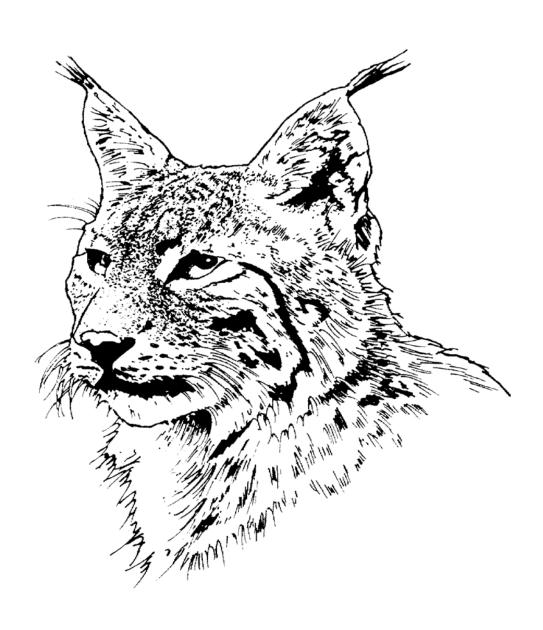
<sup>&</sup>lt;sup>59</sup> USDA. 2011. Forest Service watershed condition framework, a framework for assessing and tracking changes to watershed condition. Washington, DC: USDA, Forest Service. Watershed, Fish, Wildlife, Air, and Rare Plants Program.

Lake sub-watersheds (12th hydrologic unit code) are identified for inclusion in the Conservation Watershed Network as they contain bull trout critical habitat and disjunct local bull trout populations.



March 2007

# Northern Rockies Lynx Management Direction Record of Decision



The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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## **Record of Decision Table of contents**

Summary of the decision	1
Background	1
Purpose and need	2
Risks to lynx and lynx habitat	2
Public involvement	4
Issues	5
Alternatives considered in detail	5
Other management direction considered	7
The decision	7
Management direction related to vegetation	8
Objectives for vegetation management	8
Standards and guidelines relating to quantitiy of winter snowshoe hare habitat	8
Standards and guidelines relating to qualtiy of winter snowshoe hare habitat	11
Standards and guidelines relating to denning habitat	14
Consideration of fuel treatment projects	18
FWS findings related to the vegetation management direction	21
Management direction related to grazing	21
Management direction related to human uses	22
Over-the-snow recreation	22
Developed recreation	25
Minerals and energy	26
Forest roads	26
Management direction related to linkage areas	27
Use of standards and guidelines	28
Where to apply the decision	29
Incorporation of terms and conditions	29
Consideration of conservation recommendations	30
Canada lynx recovery outline	31

#### Record of Decision - Table of contents

Findings required by laws, regulations and policy	35
National Environmental Policy Act	35
National Forest Management Act	37
Endangered Species Act	42
National Historic Preservation Act	43
Clean Air Act	43
Clean Water Act	43
Invasive Species	43
Environmental justice	43
Prime Farmland, Rangeland and Forest Land	44
Equal Employmnet Opportunities, Effects on Minorities and Women	44
Wetlands and Floodplains	44
Other policies	44
Implementation and appeal provisions	44
Further information and contact person	45
References	49
Attachment 1 – Northern Rockies Lynx Management Direction	

#### Summary of the decision

We have selected Alternative F, Scenario 2 as described in the Northern Rockies Lynx Management Direction Final Environmental Impact Statement (FEIS) (pp. 35 to 40), with modifications. We modified Alternative F, Scenario 2 and incorporated the U.S. Fish and Wildlife Service (FWS) Terms and Conditions (USDI FWS 2007), where applicable, into the management direction – see Attachment 1- hereafter called the *selected alternative*. We determined the selected alternative provides direction that contributes to conservation and recovery of Canada lynx in the Northern Rockies ecosystem, meets the Purpose and Need, responds to public concerns, and is consistent with applicable laws and policies. In the FEIS we analyzed six alternatives in detail and two scenarios for Alternative F. Of those, we determined Alternative F Scenario 2 is the best choice. With this decision, we are incorporating the goal, objectives, standards, and guidelines of the selected alternative into the existing plans of all National Forests in the Northern Rockies Lynx Planning Area – see Figure 1-1, FEIS, Vol. 1 Tables 1-1 and 1-2.

The direction applies to mapped lynx habitat on National Forest System land presently **occupied** by Canada lynx, as defined by the *Amended Lynx Conservation Agreement* between the Forest Service and the FWS (USDA FS and USDI FWS 2006). When National Forests are designing management actions in **unoccupied** mapped lynx habitat they should consider the lynx direction, especially the direction regarding linkage habitat. If and when those National Forest System lands become occupied, based upon criteria and evidence described in the Conservation Agreement, the direction shall then be applied to those forests. If a conflict exists between this management direction and an existing plan, the more restrictive direction will apply.

The detailed rationale for our decision, found further in this document, explains how the selected alternative best meets our decision criteria. Those decision criteria are: 1) meeting the Purpose and Need to provide management direction that conserves and promotes the recovery of Canada lynx while preserving the overall multiple use direction in existing plans; 2) responding to the issues; and 3) responding to public concerns.

#### **Background**

The FWS listed Canada lynx as a threatened species in March 2000, saying the main threat was "the lack of guidance for conservation of lynx and snowshoe hare habitat in National Forest Land and Resource Plans and BLM Land Use Plans" (USDI FWS 2000a). Following the listing, the Forest Service (FS) signed a Lynx Conservation Agreement with the FWS in 2001 to consider the Lynx Conservation Assessment and Strategy (LCAS) during project analysis, and the FS agreed to not proceed with projects that would be "likely to adversely affect" lynx until the plans were amended. The Conservation Agreement (CA) was renewed in 2005 and added the concept of occupied mapped lynx habitat. In 2006 the CA was amended to define occupied habitat and to

list those National Forests that were occupied. In 2006 it was also extended for 5 years (until 2011), or until all relevant forest plans were revised to provide guidance necessary to conserve lynx (USDA FS and USDI FWS 2000, 2005, 2006a, 2006b). The plan direction in this decision fulfills our agreement to amend the plans. The management direction provided in this decision is based upon the science and recommendations in:

- *Ecology and Conservation of Lynx in the United States* (Ruggiero et al 2000), which summarizes lynx ecology;
- Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al 2000), which recommends conservation measures for activities that could place lynx at risk by altering their habitat or reducing their prey; and
- Numerous publications cited in the FEIS and found listed in the *References* section of this ROD and in the FEIS, pp. 381 to 396.

#### Purpose of and Need for action

The Purpose and Need is to incorporate management direction in land management plans that conserves and promotes recovery of Canada lynx, by reducing or eliminating adverse effects from land management activities on National Forest System lands, while preserving the overall multiple-use direction in existing plans (FEIS, Vol. p. 1).

#### Risks to lynx and lynx habitat

The overall goals of the LCAS were to recommend lynx conservation measures, provide a basis for reviewing the adequacy of Forest Service land and resource management plans with regard to lynx conservation, and to facilitate section 7 conferencing and consultation under ESA. The LCAS identified a variety of possible risks to lynx and lynx habitat.

The LCAS identified *risk factors affecting lynx productivity* (pp. 2-2 to 2-15) as:

- Timber management
- Wildland fire management
- Livestock grazing
- Recreational uses
- Forest backcountry roads and trails
- Other human developments

These are the typical types of activities conducted on federal land administered by the FS, and the FS has the authority to manage and regulate them. As such, the management direction analyzed in the Lynx FEIS and incorporated into the forest plans with this Record of Decision (ROD) focus on these types of activities.

The LCAS identified *risk factors affecting mortality* (pp. 2-15 to 2-17) as:

- Trapping
- Shooting
- Predator control
- Highways
- Predation by other species

These factors can directly cause lynx deaths. Trapping of lynx is no longer permitted in the planning area, although incidental trapping of lynx could still occur. Incidental or illegal shooting can also occur, but trapping and hunting is regulated by state agencies. Predator control activities are conducted by USDA Wildlife Services. Since the factors of trapping shooting and predator control are outside the authority of the FS to manage or regulate, this ROD does not include management direction related to them.

Highways (generally high-speed, two lane) are a known source of direct mortality (LCAS, pp. 2-16 to 2-17). Depending on the situation, this risk factor may fall under the authority of the FS. Therefore, it is addressed in the FEIS, and management direction concerning highways is incorporated into the Forest Plans through this ROD.

Other predators may affect lynx. Lynx have a competitive advantage in places where deep, soft snow tends to exclude predators in mid-winter, the time when prey is most limiting. Certain activities, such as certain types of winter recreation, may provide access to other predators (LCAS, pp. 2-6 to 2-15). The FEIS and ROD addresses this concern.

The LCAS identified *risk factors affecting movement* (pp. 2-17 to 2-19) as:

- Highways and associated development
- Private land development

Lynx are known to disperse over wide areas. Highways and the developments associated with them may affect lynx movement (LCAS, p. 2-17). The FS has only limited authority to address highways, and has no authority to manage activities on private land. Based on the limited authority the FS has in this area, only a few guidelines address these risk factors.

After the LCAS was issued the FWS published a Clarification of Findings in the Federal Register (FEIS, Vol. 1, Appendix P), commonly referred to as the Remand Notice. In the Remand Notice the FWS states, "We found no evidence that some activities, such as forest roads, pose a threat to lynx. Some of the activities suggested, such as mining and grazing, were not specifically addressed [in the Remand Notice] because we have no information to indicate they pose threats to lynx" (p. 40083). Further on in the Remand Notice they state, "Because no evidence has been provided that packed snowtrails facilitate competition to a level that negatively affects lynx, we do not consider packed snowtrails to be a threat to lynx at this time" (p. 40098). In regards to timber harvest the FWS states, "Timber harvesting can be beneficial, benign, or detrimental to lynx depending on harvest methods, spatial and temporal specifications, and the inherent vegetation potential of the site. Forest practices in lynx habitat that result in or retain a dense understory provide good snowshoe hare habitat that in turn provides good foraging habitat for lynx" (p. 40083). These findings by FWS narrow the focus from the concerns first published in the LCAS (discussed above) about what management direction is needed to maintain or improve Canada lynx habitat. We considered this information in the development of the selected alternative, and in our decision.

#### **Public involvement**

We involved the public in the development of the plan direction from the very beginning. In order to determine the scope of the public's interest in developing lynx direction the FS and BLM started with a notice published in the *Federal Register* (Vol. 66, No. 176, pp. 47160 to 47163) on September 11, 2001. Originally, the scoping period was scheduled to end on October 26, 2001, but we extended it to December 10, 2001. The FS and BLM gave people more time to comment, both in response to several requests for extensions, and because of the general disruption stemming from the September 11<sup>th</sup> terrorist attacks. In December 2006, the BLM elected to not be a cooperating agency in this planning effort and to undertake changes to BLM plans through a separate planning process.

We created an official website at <a href="www.fs.fed.us/r1/planning/lynx.html">www.fs.fed.us/r1/planning/lynx.html</a>. The website continues to provide information, including the information used to develop the Proposed Action, the DEIS, and FEIS.

During scoping we held numerous open-house meetings to provide a better understanding of the lynx proposal and to gain an understanding of public issues and concerns (FEIS, Vol. 1, p. 18). We mailed out more than 6,000 letters about the proposal and upcoming meetings to a mailing list of people interested in land management issues. By December 17, 2001 we had received 1,890 public responses to the scoping notice. We then evaluated and summarized those responses in a report entitled *Summary of Public Comments* (see the *Scoping* section of the Project Record). Responses received after December 17, 2001, but before the release of the Draft Environmental Impact Statement (DEIS) in January 2004 were also considered. A summary of these comments can also be found in the *Scoping* section of the Project Record. In mid-May 2002 we mailed an eight-page update to the more than 2,000 addresses of those who responded to the scoping notice.

We decided to prepare an EIS because of the level of interest expressed during scoping. On August 15, 2002, we published a Notice of Intent to prepare an Environmental Impact Statement in the *Federal Register* (Vol. 67, No. 158, pp. 53334 to 53335). There were five responses to the Notice of Intent, which we also considered.

On January 16, 2004, a Notice of Availability of the DEIS was published in the *Federal Register* (Vol. 69, No. 11, p. 2619). This notice began a 90-day public comment period. At that time, we sent copies of the DEIS (either paper or CD versions), or the summary of the DEIS to a variety of interested parties (FEIS, Vol. 1 p 19). The documents are also available on the web site: <a href="https://www.fs.fed.us/r1/planning/lynx.html">www.fs.fed.us/r1/planning/lynx.html</a>.

We hosted open-house meetings in February and March of 2004 to provide the public with a better understanding of the DEIS and its alternatives. Over 380 people attended the open houses which were held in four states and 25 communities. We accepted public comments on the DEIS either sent through the mail or via E-mail. The public comment period ended on April 15, 2004, with the agency receiving well over 5,000

comments. We used those comments, as well as late comments, to help formulate Alternative F, to help clarify and add to the analysis, to correct errors in the DEIS, and to update the FEIS. We responded to all of the comments on the DEIS in the Response to Comments (FEIS, Vol. 2).

#### **Issues**

As a result of the public participation process; review by other federal, state, tribal, and local government agencies; and internal reviews, we identified five primary issues, which are described in detail in the FEIS, Vol. 1, Chapter 2. The issues were used as a basis for developing the management direction in the alternatives, and were used to analyze effects. The issues are:

- 1. Over-the-snow recreation. The effects of limiting the growth of designated over-the-snow routes on opportunities for over-the-snow recreation.
- **2.** *Wildland fire risk.* The effects of the management direction on the risks to communities from wildland fire.
- **3.** Winter snowshoe hare habitat in multistoried forests. The effect on lynx of allowing projects in winter snowshoe hare habitat in multistoried forests.
- **4. Precommercial thinning.** The effects of limiting precommercial thinning on restoring tree species and forest structures that are declining.
- **5.** *FWS Remand decision.* The appropriate level of management direction applied to activities that the FWS remand notice found were not a threat to lynx populations.

#### Alternatives considered in detail

Alternative A, the No Action Alternative. Analyzing a no-action alternative is a requirement of NEPA at 40 CFR 1508.14(d), and of FS planning procedures. The analysis of the effects of Alternative A in the FEIS considers the effects of the forest plans as they currently exist, including any previous amendments. In this case, "no action" means no amendment to the already existing plans, and no additional specific direction to conserve Canada lynx. While the FS has been following the Conservation Agreements signed with the FWS and has considered the LCAS when evaluating projects, the LCAS measures have not been incorporated as plan direction. A decision to adopt Alternative A would not adopt the measures of the LCAS into the plans, but also would not void the existing Conservation Agreements or the consultation requirements of ESA. A decision to not adopt some of the lynx management direction in any of the action alternatives would have been a decision to select a part of Alternative A.

Alternative B, the Proposed Action. The Proposed Action was developed from conservation measures recommended in the LCAS. (See Appendix A in the FEIS, pp. 401 to 438 for a crosswalk from the LCAS, to the proposal as written in the scoping letter; the Proposed Action, Alternative B, found in the Draft and Final EISs; and

Alternative F in the FEIS.) Alternative B addresses activities on National Forest System lands that can affect lynx and their habitat. The exact language of the goal, objectives, standards, and guidelines for Alternative B and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

**Alternative C.** Alternative C was designed to respond to issues of over-the-snow recreation management and foraging habitat in multistoried forests, while providing a level of protection to lynx comparable to Alternative B, the Proposed Action. Alternative C would add direction to the plans similar to the LCAS, but would have fewer restrictions on new over-the-snow trails and more restrictions on management actions in winter snowshoe hare habitat in multistoried forests. The exact language of the goal, objectives, standards, and guidelines for Alternative C and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

Alternative D. Alternative D was designed to address the issues of managing over-the-snow recreation and multistoried forests, similar to Alternative C. Alternative D also allows some precommercial thinning in winter snowshoe hare habitat, while still contributing to lynx conservation. Alternative D would add direction to the plans similar to the LCAS, but having fewer restrictions on new over-the-snow trails and precommercial thinning, and more restrictions than the LCAS (Alternative B) on management actions in winter snowshoe hare habitat in multistoried forests, but less than Alternative C. The exact language of the goal, objectives, standards, and guidelines for Alternative D and all the other action alternatives can be found in the FEIS (Table 2-1, pp. 41 to 69).

Alternative E, the DEIS preferred alternative. Alternative E addresses the issue of wildland fire risk while contributing to lynx conservation. It also responds to statements made in the Remand Notice (USDI FWS, 2003) that FWS has no information to indicate grazing or snow compaction are threats to lynx at this time. This was done by changing the grazing and human uses standards to guidelines. Alternative E would add direction to the plans similar to the LCAS, but has fewer restrictions on new overthe-snow trails and on fuel reduction projects proposed in a collaborative manner, and more restrictions on management actions in winter snowshoe hare habitat in multistoried forests. The exact language of the goal, objectives, standards, and guidelines for Alternative E and all the other action alternatives can be found in FEIS (Table 2-1, pp. 41 to 69).

Alternative F, the FEIS preferred alternative. Alternative F was developed from public comments on the DEIS and by pulling together parts of the other alternatives. Since it was developed from the other alternatives, the effects of Alternative F is within the scope of the effects of the alternatives analyzed in the DEIS.

Alternative F addresses many comments about problems and concerns with Alternatives E, the DEIS preferred alternative. In particular many people and FWS felt Alternative E would not meet the purpose and need because it did not provide the

regulatory mechanisms to adequately address lynx needs. Alternative F was designed to provide adequate regulatory mechanisms for those risk factors found to be a threat to lynx populations – specifically those factors related to the quantity and quality of lynx habitat as discussed in the FEIS, Vol. 1, section *Management direction considered*.

Alternative F addresses comments about where to apply the management direction. Many comments suggested the management direction should only be applied to occupied habitat. Therefore, Alternative F is evaluated under two scenarios: (1) management direction would be incorporated into all forest plans and would *apply to all mapped lynx habitat*, whether or not occupied; and (2) management direction would be incorporated into all forest plans but would only *apply to occupied habitat*. Under Scenario 2, the direction should be "considered" for unoccupied units, but would not have to be followed until such time as lynx occupy the unit. The Nez Perce, Salmon-Challis, Beaverhead-Deerlodge, Bitterroot, Ashley, and Bighorn NFs, and the disjunct mountain ranges on the Custer, Gallatin, Helena, and Lewis and Clark NFs are unoccupied based on the best scientific information available at this time (USDA FS, USDI FWS 2006a).

#### Other management direction considered

Comments on the DEIS identified a variety of suggestions for management direction. Some of the suggestions were incorporated into the selected alternative, others were not. The FEIS, Vol. 1 pp. 71-102 provides a thorough discussion of these comments and our considerations. The following section includes discussion of some these comments and how they were considered, but not all of the suggestions considered.

#### The decision

The management direction in Alternative F, Scenario 2 modified (referred from now on as the *selected alternative*, see - Attachment 1) is amended into all Forest Plans in the planning area. The management direction incorporates the terms and conditions FWS issued in their biological opinion (USDI FWS 2007). This management direction includes a goal, objectives, standards, and guidelines related to all activities (ALL), vegetation management (VEG), grazing management (GRAZ), human uses (HU), and linkage (LINK). *Goals* are general descriptions of desired results; *objectives* are descriptions of desired resource conditions; *standards* are management requirements designed to meet the objectives; and *guidelines* are management actions normally taken to meet objectives. Guidelines provide information and guidance for project and activity decision-making (FEIS, Vol. 1 p. 8). The Forest Service and FWS developed the selected alternative in a collaborative manner (Project File/Coordination/with FWS, and Project File/Alternatives/FEIS alternatives).

The selected alternative provides a balance of meeting the purpose and need, and addressing the five primary issues, including other public comments. Alternative B does not provide the management direction necessary for winter snowshoe hare habitat

in multistoried forests. Alternative C, may be best for lynx, but does not address any other issues. Alternative D addresses the need to restore tree species in decline, but we have determined it may allow too much activity in winter snowshoe hare habitat and result in more extensive adverse effects. Alternative E address wildfire risk to communities, but based on our analysis and comments from FWS and the public, may not provide the necessary direction to contribute to conservation and recovery of lynx.

We determined, through our analysis and with concurrence from FWS, the selected alternative contributes to conservation and recovery of lynx, while allowing some activities to occur in lynx habitat that may have some adverse effects on lynx. We determined it was important and acceptable to restore tree species in decline and address wildland fire risks to communities. This decision allows some possible adverse effects on 6.5 percent of lynx habitat (through a combination of fuels treatment in the wildland urban interface (WUI) and precommercial thinning). However, all vegetative standards remain applicable to 93.5 percent of lynx habitat.

The following describes the risk factors, what the LCAS proposed (Alternative B), issues related to the proposed action, what Alternative E (the DEIS preferred alternative) included, comments we received on the DEIS, consideration of new information, and finally what was incorporated into the selected alternative and why.

#### Management direction related to vegetation

Lynx require certain habitat elements to persist in a given area. Lynx productivity is highly dependent on the quantity and quality of winter snowshoe hare habitat. Winter snowshoe hare habitat may be found in dense young regenerating forests – where the trees protrude above the snowline and in multistoried forests where limbs of the overstory touch the snowline, in addition to shorter understory trees that provide horizontal cover. Certain activities, such as timber harvest, prescribed burning and wildfires, can affect the amount and distribution of these habitat elements, which can in turn affect lynx productivity. Timber harvest can be beneficial, benign, or detrimental depending on the harvest method, the spatial and temporal occurrence on the landscape and the inherent vegetation potential of the site (FEIS, Vol. 1, Appendix P).

#### Objectives for vegetation management

Objectives define desired conditions for lynx habitat. The LCAS identified four primary objectives which are reflected in Alternative B as *Objectives VEG O1*, *VEG O2*, *VEG O3*, and *VEG O4*. These objectives essentially remain the same among all alternatives. Objectives VEG O1, VEG O2 and VEG O4 were clarified in the selected alternative based on comments on the DEIS, but their intent is the same as the in LCAS.

#### Standards and guidelines relating to quantity of winter snowshoe hare habitat

**Standard VEG S1.** In order to provide a distribution of age classes, the LCAS recommended that an lynx analysis unit (LAU) (an area the size of a female lynx home range) not have more than 30 percent of the lynx habitat in an unsuitable condition, and

if an LAU was at 30 percent then vegetation management projects should not create more. Lynx habitat in an unsuitable condition includes those forests in a stand initiation structural stage that are too short to provide winter snowshoe hare habitat. These conditions are created by stand-replacing wildfires, prescribed burns that remove all of the vegetation, or regeneration timber harvest. This recommendation is reflected in Alternative B *Standard VEG S1*.

Some people felt the 30 percent criterion was too high and others said it was too low based on how fires burn in lynx habitat. In addition, some people felt that constraining the 30 percent criterion to a single LAU was too restrictive, as fires burn across vast areas. Fire is the most common disturbance in lynx habitat. Generally, large stand replacing fires burn every 40 to 200 years and smaller low intensity fires burn in the intervals between stand replacing fires (FEIS, Vol. 1, p. 72 and 213-214). The 30 percent criterion was based on a way to maintain lynx habitat over time (Brittel et al. 1989).

None of the alternatives change the 30 percent criterion. However, Alternatives C, D, and E change the area the standard would be considered from an LAU to a larger landscape. Alternatives C and E apply the standard to an LAU or in a combination of immediately adjacent LAUs; Alternative D applies the standard to a subbasin or isolated mountain range. Some people liked the idea of applying the standard to a larger area, others did not. In their comments on the DEIS FWS recommended the standard be applied to a single LAU in order to maintain a good distribution of lynx habitat at the scale of a lynx home range.

The selected alternative applies the management direction to a single LAU to ensure a variety of structural stages are provided within the home range. In addition, the selected alternative was reworded to clarify what "unsuitable habitat" entails and what types of vegetation projects create this condition.

**Standard VEG S2.** The LCAS also recommended that timber harvest not change more than 15 percent of lynx habitat to an unsuitable condition (stand initiation structural stage that is too short to provide for winter snowshoe hare habitat) over a decade. The purpose of this standard was to limit the rate of management induced change in lynx habitat (FEIS p. 74). This recommendation is reflected in Alternative B *Standard VEG S2*.

In 2003, the effect timber harvest historically had on creating "unsuitable habitat" on Forest Service lands in Region 1 (Hillis et al. 2003) was analyzed. The analysis was based on hydrologic unit codes (HUC) (similar to the size of a lynx home range). This analysis found only 2.5 percent of the HUCs exceeds the 15 percent criterion. Since this criterion was rarely exceeded in the past, and the amount of regeneration harvest the agency does now has been dramatically reduced over the past decade (Project File/Analysis/Vegetation/FEIS/Data), Standard VEG S2 was changed to Guideline VEG G6 in Alternative C, and dropped as a standard or guideline in Alternatives D and E.

FWS comments on the DEIS said that dropping Standard VEG S2 could allow potentially negative effects to lynx to accumulate. Removal of the standard could result in reducing the amount of lynx habitat over a short period of time. Based on these comments, Standard VEG S2 was included in the selected alternative. In addition, the standard was reworded to clarify that it only applies to timber management practices that regenerate a forest (clearcut, seed tree, shelterwood, group selection).

Guideline VEG G1. The LCAS also recommended creating forage (winter snowshoe hare habitat) where it was lacking. *This is reflected as Guideline VEG G1 in Alternative B*. This guideline is retained in the selected alternative. The wording clarifies that the priority areas for creating forage should be in those forests that are in the stemexclusion, closed canopy structural stage to enhance habitat conditions for lynx and their prey. Basically it says we should focus regeneration efforts in pure lodgepole stands, with little understory, especially where forage is lacking.

Other related comments. Other comments we received on the DEIS relating to the amount or spatial distribution of winter snowshoe hare habitat were in regards to including a standard to limit type conversion, and limiting the size of clearcuts and other regeneration harvest units (FEIS Vol. 1 p. 75-76 and FEIS Vol. 2 27-27, 56-57, 59-60). Neither of these standards were recommended in the LCAS.

Objectives VEG O1, VEG O2, VEG O3 and VEG O4 describe the desired conditions of lynx habitat and all are consistent with the intent to minimize habitat conversions. Projects and activities should be designed to meet or move towards objectives; therefore a standard for type conversion was not necessary.

Openings created by even-aged harvest are normally 40 acres or less. Creating larger openings requires 60-day public review and Regional Forester approval, with some exceptions (R1 Supplement Forest Service Handbook 2400-2001-2; R2 Supplement 2400-99-2). Koehler (1990) speculated that openings created by regeneration harvest, where the distance-to-cover was greater than 325 feet, might restrict lynx movement and use patterns until the forest re-grows. While it is assumed lynx would prefer to travel where there is forested cover, the literature contains many examples of lynx crossing unforested openings (Roe et al. 2000).

Larger openings can often more closely resemble vegetative patterns similar to natural disturbance events (e.g. fire, windthrow, and insect outbreaks) (FEIS, Vol. 1, Appendix P). A disturbance pattern characterized by a few large blocks may be desirable if large areas of forested habitat are a management goal, or if the predation and competition that occur at the edges between vegetation types is a problem (Ruggiero et al. 2000, p. 431). While it is true lynx may not use large openings initially, once they have re-grown and can provide cover, generally after ten to 30 years, such areas may be important to lynx (FEIS, Vol. 1, Appendix P, p. 40092).

The selected alternative already contains direction to consider natural disturbances and maintain habitat connectivity. Based on this management direction and evaluating the information in the *Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000) and the LCAS, we decided that a standard limiting the size of openings was unnecessary to improve lynx conservation.

#### Standards and guidelines relating to quality of winter snowshoe hare habitat

Snowshoe hare are the primary prey for lynx. Winter snowshoe hare habitat is a limiting factor for lynx persistence. Snowshoe hare habitat consists of forests where young trees or shrubs grow densely. In addition to dense young regenerating forests, multistory forests that have trees whose limbs come down to snow level and have an abundance of trees in the understory, also provide winter snowshoe hare habitat. During winter, hare forage is limited to twigs and stems that protrude above the snow and the hares can reach. The LCAS recommended management direction to address winter snowshoe hare habitat in relation to precommercial thinning. Alternative B, the proposed action, splits the management direction to address actions occurring in winter snowshoe hare habitat in young regenerating forests (Standard VEG S5) and actions occurring in winter snowshoe hare habitat found in multistory forests (Standard VEG S6).

**Standard VEG S5.** The LCAS recommended no precommercial thinning that reduces winter snowshoe hare habitat in the *stand initiation structural stage*. This is reflected in Alternative B *Standard VEG S5.* Precommercial thinning within 200 feet of administrative sites, dwellings, or outbuildings has been allowed under current practices because it was found to have no effect to lynx due to location near structures.

Some people said this standard should apply to all vegetation management projects, not just precommercial thinning. Precommercial thinning is the primary activity that occurs in young regenerating forests. On occasion, other activities such as fuel treatments or prescribe burning, could occur. Alternatives C and D were expanded to apply to all vegetation management projects. Alternative E, the DEIS preferred alternative, only applied it to precommercial thinning projects.

Only a few comments were received on the DEIS saying the standard should apply to all type of projects. FWS did not comment on the more narrow application of the standard.

Standard VEG S5 in the selected alternative only applies to precommercial thinning because it is the predominate activity in young regenerating forests and it is has been identified as the risk factor for reducing winter snowshoe hare habitat (LCAS, Ruggiero et al. 2000, USDA FS and USDI BLM 2000, USDI FWS 2000a, 2000b, USDI FWS 2003).

As noted earlier in the issues section, some people said precommercial thinning should be allowed to restore tree species in decline or to encourage future large trees. Alternative D addresses this issue by allowing precommercial thinning of planted western white pine, whitebark pine, aspen, and larch, ponderosa pine, and lodgepole pine in certain situations. Alternative E, the DEIS preferred alternative, only allowed precommercial thinning adjacent to structures, for research or genetic tests, or for fuel treatment projects identified in a collaborative manner.

Several comments on the DEIS said the allowances for precommercial thinning in Alternative D should be incorporated into the final alternative. Several comments said that some allowance for adaptive management should be incorporated and that thinning should be allowed where it could be done to promote or prolong winter snowshoe hare habitat.

FWS comments on the DEIS said thinning adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests would have little effect on lynx or their habitat. In addition, they said the following thinning activities would have cumulatively little effect upon lynx habitat and, in some cases, advance natural ecological conditions. These include: (1) daylight thinning of planted rust-resistant western white pine where 80 percent of winter snowshoe hare habitat is maintained; (2) thinning within whitebark pine stands; (3) western white pine pruning; and (4) thinning for Christmas trees.

We evaluated the comments and incorporated the following elements into the selected alternative:

- Since Standard VEG S5 is concerned with reduction of winter snowshoe hare
  habitat, western white pine pruning and thinning for Christmas trees can occur if
  winter snowshoe hare habitat is not reduced. Generally these activities are done on
  an individual tree basis and do not change the characteristics of the habitat.
- Precommercial thinning can be done adjacent to administrative sites, dwellings, or outbuildings and for research and genetic tests since these would have benign effects on lynx.
- Precommercial thinning can be done for planted rust-resistant western white pine, whitebark pine, and aspen. Thinning to enhance whitebark pine and aspen would benefit other wildlife species and effects only limited acres in lynx habitat (FEIS, Vol. 1 Lynx section). Daylight thinning will be allowed around individual planted rust-resistant western white pine where 80 percent of the winter snowshoe hare habitat is retained. This may reduce some habitat effectiveness, but since this tree species has declined 95 percent across its range, we determined it was important to allow a limited amount of thinning to retain the species on the landscape.

Under these exceptions, about 64,000 acres could be precommercial thinned in occupied lynx habitat over the next decade – assuming full funding. This is likely to affect less than 2 percent of winter snowshoe hare habitat (FEIS Vol. 1 p. 188, USDI FWS 2007).

We also considered allowing precommercial thinning in vast areas of young regenerating forests where precommercial thinning could be done to prolong winter snowshoe hare habitat. We also considered precommercial thinning in young regenerating forests composed primarily of western larch with more than 10,000 trees

per acre – where larch would be removed to favor other species that provide better winter snowshoe hare habitat. In both these situations the general belief is that these activities may be beneficial to lynx in the long term, but information is not available at this time to support that hypothesis. So, the standard was modified to provide an avenue to consider new information that may in the future prove or disprove these hypotheses. The criterion provided in the selected alternative states:

Based on new information that is peer reviewed and accepted by the regional level of the Forest Service and the state level of FWS, where a written determination states:

- a. that a project is not likely to adversely affect lynx; or
- b. that a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.

This criterion allows incorporation of new peer reviewed information, but requires agreement by FWS before it may be utilized.

**Standard VEG S6.** The LCAS recommended no precommercial thinning that reduces winter snowshoe hare habitat in multistory forests. This is reflected in Alternative B Standard VEG S6. Precommercial thinning within 200 feet of administrative sites, dwellings or outbuildings has been allowed under current practices because it was found to have no effect to lynx due to location near structures. The LCAS did not contain a recommendation related to other management actions.

As noted in Issue #3 some people said the management direction should preclude all activities that reduce winter snowshoe hare habitat in multistory forest. Alternatives C, D, and F would apply the management direction to all vegetation management activities in multistory forests that provide winter snowshoe hare habitat. Each alternative has different allowances for vegetation management. Alternative E, the DEIS preferred alternative, changed the management direction from a standard to Guideline VEG G8. The intent of the guideline was to direct vegetation projects to provide winter snowshoe hare habitat through time.

Multistory forest structures can develop from natural processes, such as insects and diseases and fire, or management actions like timber harvest that create small openings where trees and shrubs can grow.

Comments on the DEIS suggested that management direction for multistory forests should be in the form of a standard. FWS suggested the agencies review the latest information or research on lynx use of forests in multistoried structural stages prior to developing a final preferred alternative.

Recent research in northwest Montana demonstrates that mature multistoried forests provide important winter snowshoe hare habitat and are more important than younger stands (FEIS, Vol. 1, p. 22). In fact, the researchers questioned whether or not the LCAS would provide for lynx viability and recovery if only precommercial thinning were precluded.

Based on this new information we retained Standard VEG S6 in the selected alternative, but we preclude *all* vegetation management activities that reduce winter snowshoe hare habitat in multistory forests, not just precommercial thinning as recommended in the LCAS. We would allow minor reductions in winter snowshoe hare habitat for activities within 200 feet of structures, research or genetic tests, and for incidental removal during salvage harvest (associated with skid trails). Fuel treatment projects within the WUI are also exempt from this standard (see fuel treatment discussion further in this decision). We also allow timber harvest in areas that have the potential to improve winter snowshoe hare habitat but presently have poorly developed understories.

We believe and FWS concurred that protecting winter snowshoe hare habitat in multistoried forests will further retain and promote important lynx habitat components.

### Standards and guidelines relating to denning habitat

Woody debris – piles of wind-thrown trees, root wads, or large down trees – provides lynx denning sites. Large woody debris gives kittens an escape route from predators, as well as cover from the elements. During the first few months of life, when kittens are left alone while the mother hunts, denning habitat must be available throughout the home range (Bailey 1974). The LCAS recommended two standards and two guidelines related to denning habitat. These are reflected in Alternative B as *Standards VEG S3 and VEG S4 and Guidelines VEG G2 and VEG G3*.

In Alternative B Standard VEG S3 defers vegetation management projects in places with the potential to develop into denning habitat if an LAU contains less than ten percent denning habitat. Standard VEG S4 limits salvage harvest in some situations. Guideline VEG G2 says when more denning habitat is desired to leave standing trees and coarse woody debris. Guideline VEG G3 says to locate denning habitat where there is a low probability of stand-replacing fire.

## Development of alternatives for the DEIS

Some people said that den sites can be found in old regenerating forests and the agency should be allowed the flexibility to create denning habitat in regeneration units, especially since denning habitat should be located in or adjacent to forage. In Maine, 17 den sites were located in a variety of stand types, including 10-20 year old clearcuts adjacent to residual stands (FEIS, Vol. 1, Appendix P).

After reviewing the literature, we determined it was reasonable to have an alternative that allows for flexibility to mitigate or create denning habitat, especially when there is less than 10 percent denning habitat. Alternatives D and E modify Standard VEG S3 to say where there is less than 10 percent denning habitat either: 1) defer management, or 2) move towards 10 percent by leaving standing dead trees or piles of coarse woody debris. This combined the guidance in Alternative B, Guideline VEG G2 with the Standard VEG S3.

Some people said salvage harvest should not be singled out because it is not the only management action that removes denning habitat. Standard VEG S4 limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat.

We evaluated whether other management actions, such as prescribed burning, chipping, piling and burning, etc. should be precluded. Salvage harvest is the primary management action that removes denning habitat because it removes dead and down timber; therefore we determined other actions did not need to be constrained. However, we determined that Standard VEG S4 should be a guideline in Alternatives D and E because it provides guidance on how to design projects. The guideline says when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees. As noted in Alternatives D and E, Standard VEG S3, units can mitigate when there is less than 10 percent denning habitat. It is possible to create denning habitat or retain pockets, but units should be allowed to evaluate denning needs on a site specific basis.

The intent of Alternatives D and E, is where denning habitat is lacking, units should recognize it, retain large and small patches and/or mitigate, especially if it denning habitat can be created in or near new forage areas. In most areas denning habitat is likely not limiting because it is found in such a variety of stand conditions and ages.

#### Considerations for alternatives in the FEIS

In comments on the DEIS some people said there was no basis for retaining ten percent denning habitat – they wanted the standard dropped altogether. Others wanted more denning habitat required. Some people asked for an alternative to prohibit harvest in old growth or mature timber to protect denning habitat. Others said that all old growth should be protected by management direction because some administrative units do not meet old growth standards.

Some people said allowing salvage logging in disturbed areas smaller than five acres lacked a scientific basis and that all salvage harvest should be deferred. Most comments on the DEIS said that management direction for denning habitat should be in the form of standards.

In their comments on the DEIS FWS supported Standard VEG S3, including conditions 1 and 2 in Alternative E, but was concerned about changing Standard VEG S4 into Guideline VEG G7. FWS recommended development of a standard that: 1) maintains ten percent denning habitat within an individual LAU; 2) is randomly/evenly distributed across the LAU; and 3) ensures recruitment of future denning habitat.

Based on these comments, we reconsidered the management direction for denning habitat. We held discussions with the researchers, lynx biology team and FWS to further explore denning habitat – where it is found, how to measure it, and how to ensure plans provide the appropriate level of management direction.

Where denning habitat is found: Since 1989 researchers have discovered that lynx denning habitat is found in a variety of structural stages from young regenerating forests to old forests. The integral component of lynx den sites appears to be the amount of downed, woody debris, not the age of the forest stand (Mowat, et al. 2000). Research by Squires (pers. com. Oct. 30, 2006) has found that of 40 den sites in northwest Montana most were located under large logs, but "jack-strawed" small diameter wind thrown trees, root wads, slash piles, and rock piles were also used (FEIS, Vol. 1 p. 172-173). These structural components of lynx den sites can often be found in managed (logged) and unmanaged (e.g. insect damaged, wind-throw) stands.

How to measure denning habitat: Retaining ten percent denning habitat is based on maintaining lynx habitat over time (Brittel et al. 1989). Brittel recommended a balance of conditions – 30 percent forage, 30 percent unsuitable that would grow into forage, 30 percent travel, and ten percent denning.

We evaluated how to measure 10 percent denning based on where the habitat can be found. We evaluated using mature and over-mature forests as a first approximation of denning habitat. Generally mature and over-mature forests contain a component of dead and down trees which lynx use. If these two components were used then all units would show much more than ten percent denning habitat as all forests have at least twenty percent of their forest in mature stand structures (Project file/Analysis/Forests/FEIS/Data). In addition, these stand structures do not account for all the stand conditions where denning habitat can be found because denning habitat can be found in young forests with slash piles, lodgepole forests with insect and disease outbreaks, areas recently burned in wildfires, as well as variety of other forest conditions. Based on these discussions, we decided, with agreement from FWS, that using stand structures as a proxy would show an abundance of denning habitat; therefore the requirement to retain ten percent was found not to be a useful measure.

#### How to provide for denning habitat:

We considered restricting harvest in mature forests and old growth. The important component for all lynx den sites appears to be the amount of down woody debris present, not the age of the forest (Mowat et al. 2000, Appendix P). Old growth and mature forests can provide denning habitat, but based on review of research a variety of forest structures also provide denning habitat. We considered prohibiting timber harvest in old growth but dismissed this from detailed consideration because denning habitat is found in a variety of forest structures (FEIS, Vol. 1 p. 81).

We considered restricting salvage harvest. Standard VEG S4 in Alternatives B and C limits salvage harvest after a disturbance kills trees in areas five acres or smaller – if there is less than 10 percent denning habitat. The standard was changed to a guideline in Alternatives D and F. The guideline says that when there is less than 10 percent denning habitat, then units should consider retaining small areas of dead trees.

Salvage harvest can remove denning habitat. However, den sites are found in areas with large logs, "jack-strawed" small diameter wind thrown trees, root wads, slash piles, and rock piles. These areas need not be extensive – they are generally small areas that provide sufficient cover for lynx den sites.

We reevaluated whether or not denning habitat is a limiting factor for lynx. Based on discussions with research, we reaffirmed that denning habitat is found in a variety of forest conditions, they are found in small pockets scattered across an area and are generally found across the landscape, and lynx denning sites are not believed to be a limiting factor (J. Squires, pers. com. Oct. 30, 2006). In addition, management actions can create denning habitat by strategically leaving piles of woody debris, or leaving residual trees where denning habitat is lacking.

Therefore, we determined that restricting salvage harvest was not necessary, but that projects should consider the abundance and distribution of denning habitat in their project design and leave den site components (piles of down wood, or standing dead trees) where it is lacking.

We considered management direction in the form of standards vs. guidelines. We determined management direction for denning habitat should be incorporated into one set of management direction. Incorporating all the direction into one standard or guideline reduces the potential for conflicts between directions, focusing on the important components of denning habitat.

We determined a guideline would be best suited for this management direction because denning habitat can be found in a variety of forest structures and in small areas, is not a limiting factor for lynx, and the management direction would provide design features for projects. Therefore we developed Guideline VEG G11 in the selected alternative. The guidance is to: 1) have denning habitat distributed across an LAU (in the form of pockets of large woody debris, either down logs or root wads, or large piles of jack-strawed trees); and 2) if denning habitat is lacking, projects should be designed to retain coarse woody debris – by leaving piles or retaining residual trees that can become denning habitat later.

Objectives VEG O1, VEG O2, VEG O3, and VEG O4 and Standards VEG S1, VEG S2, and VEG S6 also indirectly promote the development and retention of the structure needed for denning habitat through vegetation management that promotes a mosaic of forest conditions across the landscape (USDI FWS 2007). Based on the above, FWS determined that projects were unlikely to reduce denning structure to levels that result in adverse effects to lynx (USDI FWS 2007).

In addition, the Lynx Biology Team (the team responsible for the LCAS) is in the process of updating the LCAS denning habitat recommendations based on this new information about where denning habitat is found and its distribution.

## **Consideration of fuel treatment projects**

Most lynx habitat consists of high-elevation spruce/fir and lodgepole pine forests, but some lynx habitat may be found in mixed conifer forests. Generally, forests in lynx habitat are close to historic conditions, meaning the long fire return interval has not been affected to any large degree by more recent fire suppression as is the case in dryer forests with short fire return intervals. However, some stand conditions are conducive to extreme fire behavior because of insect and disease mortality or the amount of tree limbs that provide ladder fuels. Fuel treatments designed to reduce ladder fuels and/or reduce the potential size (Finney 2001) and severity of wildland fires may be proposed in lynx habitat.

After the 2000 wildfire season, which burned a substantial amount of acreage, the Forest Service began to set goals for wildfire management. Several documents serve to provide a national prioritization system for the selection of hazardous fuel treatments on Federal lands with close coordination among the Federal, State, and other agencies, as well as Tribes and communities. The criteria for prioritizing lands for hazardous fuels treatment generally correspond to: (1) closest proximity to communities at risk in the WUI; (2) strategic areas outside the WUI that prevent wildland fire spread into communities or critical infrastructure; (3) areas outside of WUI that are in Condition Classes 2 or 3; and (4) other considerations (FEIS, Vol. 1 p. 215).

The LCAS did not specifically address fuel treatments. During scoping we identified wildland fire risk as an issue, issue # 2 (FEIS, Vol. 1 p. 21-22). We developed a range of alternatives to address this issue.

In Alternative A, there would be no change in existing plan direction on the treatment of fuels.

Alternative B would allow fuel treatments to go forward if they:

- Meet the 10 percent denning standard (Standard VEG S3 and S4)
- Meet 30 percent unsuitable habitat standard (Standard VEG S1) or 15 percent unsuitable habitat created by timber harvest standard (Standard VEG S2)
- Use methods other than precommercial thinning in winter snowshoe hare habitat (Standards VEG S5 and VEG S6)

Alternatives C and D would not allow any type of fuel reduction project that reduced winter snowshoe hare habitat – except within 200 feet of structures.

Alternative E, the DEIS preferred alternative would not apply the vegetation standards (Standards VEG S1, S3, and S5) to fuel treatments developed in a collaborative manner, as described in the *10-Year Comprehensive Strategy Implementation Plan* (USDA FS 2001). This exception was used because a multi-party Memorandum of Understanding was signed in 2003 by the FS, BLM, and FWS (USDA FS et al. 2003) concerning fuel treatments and collaboration.

Many comments were received on the DEIS regarding fuel treatments. Some people suggested there be no exemptions for fuel treatments. Several groups suggested that only fuel treatments within 500 yards of human residences and other structures be allowed because these areas are generally not appropriate to restore lynx anyway. Others felt the exemptions should only apply to the WUI and that the agencies should define the WUI. Others liked the exemptions as they were written in Alternative E.

FWS cautioned against exempting a broad range and unknown number of actions from plan direction. They felt, as currently worded in Alternative E, the exemption was sufficiently vague that it did not allow an adequate analysis of potential effects upon lynx or lynx habitat and it could result in extensive adverse effects to lynx.

FWS suggested Standard VEG S5 be modified to restrict precommercial thinning to within one mile of structures. They did not believe any exemptions were needed for Standards VEG S1 or S2 since so very few LAUs were near the thresholds identified in these standards. They felt very few proposals would be constrained by the standards. They also questioned why Condition Class 1 forests were not specifically excluded from the exemptions. Condition Class 1 forests include areas where fires have burned as often as they did historically; the risk of loosing key ecosystem components is low; and vegetation composition and structure is intact and functioning. The FWS went on to say they recommended that processes, actions, or types that would be exempt be clearly identified.

We reviewed and discussed the comments with FWS and decided to modify the fuel treatment exemption for the selected alternative. We thoroughly discussed the issue of how to allow for fuel treatments to reduce the hazard to communities – while providing for the conservation and recovery of lynx (Project File/Alternatives/FEIS alternatives).

Based on our discussions we decided none of the vegetation standards will apply to fuel treatment projects within the WUI as defined by the Healthy Forests Restoration Act (HFRA), within a certain limit. We constrained the number of acres that do not meet the standards to 6 percent of lynx habitat within a National Forest, and we added the FWS term and condition that fuel treatment projects can cause no more than 3 adjacent LAUs to not meet standard VEG S1.

In addition we added Guideline VEG G10 which says fuel treatment projects within the WUI should be designed *considering* Standards VEG S1, S2, S5, and S6. The intent in adding this guideline is that although these vegetation standards do not apply to fuel treatment projects within the WUI as defined by HFRA, these projects should still consider the standards in the development of the proposal. In many cases projects can be designed to reduce hazardous fuels while providing for lynx needs. This guideline ensures lynx are considered in the project design – but allows for the flexibility of not meeting the standards in situations where meeting the standards would prevent the project from reducing the hazardous fuels in the WUI.

The following describes some of the considerations in the development of this direction.

Application to Standards VEG S1 and S2: Under Standards VEG S1 and S2 it is likely very few projects would exceed the 30 percent and 15 percent criteria because many fuel treatment projects are not regeneration harvest. If regeneration harvest is applied it is likely to be done to create a fuel break adjacent to communities or to break up the continuity of fuels (Finney 2001). Since part of our direction under the Healthy Forests Initiative is to look for ways to expedite fuel reduction projects we determined that we did not want to have to amend forest plans for the few cases where not meeting the standards may be necessary.

Application to Condition Class 1: Many forests in lynx habitat are in Condition Class 1, meaning these forests have not missed a fire cycle because large, stand-replacing fire only occurs every 100 to 200 years. However, some of these Condition Class 1 forests can still be a threat to communities. An example is lodgepole pine forests which are at the age of being susceptible to mountain pine beetle outbreaks. Regenerating lodgepole pine, adjacent to a community, may be needed to reduce the severity and size of a wildland fire. Fire is a natural process in these ecosystems; but there is a need to balance the natural process with the risk of fire destroying homes; therefore we did not limit the standard to particular condition classes.

What locations should be exempted: We evaluated various options regarding where the standards should be applied and we used a variety of criteria to evaluate which option to carry forward for detailed consideration. The criteria included: 1) is there a defined area; 2) can effects be meaningfully evaluated; 3) would it provide for community protection; and 4) does it meet the purpose and need. (For further detail see FEIS, Vol. 1 pp. 85-86 which summarizes the options and considerations and the Project File/Alternatives/FEIS Alternatives/documents July 29, 2004 through February 24, 2005).

Based on comments, national direction regarding fuel treatments, and the effects on lynx, we decided exempting fuel treatment projects within the WUI, within limits would be a reasonable balance. We decided to use the definition established by Congress in the HFRA as it established a national procedure for determining the extent of the WUI (USDI, USDA FS 2006).

What limit(s) should be applied: We elected to put a limit on the amount of fuel treatment projects that could exceed the vegetation standards, since WUI has not been mapped on all units. We evaluated the WUI based on a mile of where people live (FEIS, Vol. 1 p. 217). A one mile buffer from communities was used because HFRA describes WUI as ½ mile or 1 ½ miles depending on certain features. One mile splits this difference and is easy to approximate. Based on this analysis, we found that about 6 percent of lynx habitat is within 1 mile of communities; therefore we limited the amount of acres that can exceed the standards to 6 percent of each National Forest.

In addition, FWS identified two terms and conditions (TC) to minimize impacts of incidental take of lynx due to fuel treatment projects. TC 1 (6 percent limit) was already incorporated as described above; TC 2 says fuel treatment projects shall not result in

more than three adjacent LAUs exceeding the standard. This TC has been incorporated into the management direction – see Attachment 1.

Summary: Exempting fuel treatment projects within the WUI provided a defined area, as requested by FWS; we could evaluate the effects (FEIS, Vol. 1 Lynx section); it provides for community protection by reducing delay; and meets the purpose and need by constraining the area where adverse effects could occur. In addition we compiled information from each forest's 5 year fuel treatment program to evaluate effects – FEIS, Vol. 1, Lynx section and Appendix M, and USDI FWS 2007. This information was not available for the DEIS. We found that although we would limit adverse effects to 6 percent of lynx habitat, it is more likely only 1.4 percent or less of lynx habitat would have adverse effects. This is because the fuel treatment program of work within the WUI only amounts to 1.4 percent of lynx habitat and many projects can be designed to meet the vegetation standards. Regardless, the vegetation standards would apply to fuel treatments on 94 percent of lynx habitat.

In addition, by addressing the exemption and putting a limit on where adverse effects could occur this allowed us to take a cumulative look at the effects planning area wide vs. amending standards project-by-project.

## FWS findings related to the vegetation management direction

The vegetation management direction set forth in the selected alternative conserves the most important components of lynx habitat: a mosaic of early, mature, and late successional staged forests, with high levels of horizontal cover and structure. These components ensure the habitat maintains its inherent capability to support both snowshoe hare prey base and adequate lynx foraging habitat (and denning habitat) during all seasons. These standards are required for all vegetation management actions on at least 93.5 percent of lynx habitat in the planning area. Areas within the WUIs (totaling six percent of lynx habitat) are exempt from these standards; however VEG G10 would apply and at least requires some consideration of the standards in designing fuel reduction treatments. Precommercial thinning, allowed under the exceptions, may affect an additional 0.5 percent of lynx habitat. Where these standards are applied to vegetation management projects, we anticipate few, if any, would have adverse effects on lynx. Collectively, application of these standards for vegetation management is expected to avoid adverse effects on lynx and promote the survival and recovery of lynx populations (USDI FWS 2007).

## Management direction related to grazing

Livestock grazing may reduce or eliminate foraging habitat in areas that grow quaking aspen and willow in riparian areas (LCAS). These localized changes in habitat may affect individual lynx; however, no information indicates that grazing poses a threat to overall lynx populations (FEIS, Vol. 1, Appendix P, p. 40083). Appropriate grazing management can rejuvenate and increase forage and browse in key habitats such as riparian areas. Grazing was not mentioned in the original listing decision as a threat to

lynx, nor is it discussed in *the Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000). In addition, FWS noted that they have found no research that provides evidence of lynx being adversely affected by grazing within the planning area or elsewhere, or of lynx movements within home ranges being impeded by grazing practices (USDI FWS 2007).

The LCAS recommended four standards for grazing management. These are reflected in Alternative B. *Standards GRAZ S1*, *GRAZ S2*, *GRAZ S3*, *and GRAZ S4* provide management direction for grazing in fire and harvest created openings, aspen stands, riparian areas and willow carrs, and shrub-steppe habitat. Alternatives C and D retain the management direction as standards. Alternative E changes the management direction to Guidelines GRAZ G1, GRAZ G2, GRAZ G3, and GRAZ G4 because neither the Remand Notice nor the *Ecology of Conservation of Lynx in the United States* recognized grazing as a threat to lynx.

Many people commented on Alternative E, the preferred alternative in the DEIS, and said the guidelines should be standards in the final alternative. Others said grazing should not be allowed at all, while two said the grazing guidelines should be retained. The FWS did not comment on the level of grazing management direction in Alternative E. We considered these comments in the FEIS Vol. 1 pp. 86-87, as well as Vol. 2, 75-76.

We decided the management direction for grazing in the selected alternative should be in form of guidelines, Guidelines GRAZ G1 through GRAZ G4 because there is no evidence grazing adversely affects lynx. These guidelines provide project design criteria for managing grazing in fire and harvest created openings, aspen, willow, riparian areas, and shrub-steppe habitats. The guidelines are designed to minimize potential adverse effects and improve habitat conditions. FWS found that with the application of these measures in most cases, there would be no effects or discountable effects to lynx (USDI FWS 2007). In addition, the Lynx Biology Team is in the process of updating the LCAS grazing recommendations.

## Management direction related to human uses

#### **Over-the-snow winter recreation**

Lynx have very large feet in relation to their body mass, providing them a competitive advantage over other carnivores in deep snow. Various reports and observations have documented coyotes using high elevation, deep snow areas (Buskirk et al. 2000). Coyotes use open areas because the snow is more compacted there, according to research conducted in central Alberta (Todd et al. 1981). In another study in Alberta, coyotes selected hard or shallow snow more often than lynx did (Murray et al. 1994).

The LCAS recommended two objectives and two standards relating to winter dispersed recreation. These are reflected in Alternative B, *Objectives HU O1 and HU O3, and Standards HU S1 and HU S3*. In Alternative B, Standard HU S1 would maintain the existing level of groomed and designated routes. All action alternatives contain

Objectives HU O1 and HU O3 that discourage expanding snow-compacting human activities. Alternatives B, C, and D contain Standard HU S1 that would allow existing over-the-snow areas to continue but not expand into new, un-compacted areas. Alternative E, the DEIS preferred alternative, contains Guideline HU G11 that discourages the expansion of designated over-the-snow routes and play areas into uncompacted areas. All alternatives would allow existing special use permits and agreements to continue.

In comments on the DEIS some people asked that no dispersed over-the-snow use be allowed off groomed or designated trails and areas, saying the no net increase in groomed or designated routes did not go far enough. Others said the management direction should be in the form of a standard, not a guideline.

Some people said standards related to over-the-snow use should be removed. They said there is no evidence to show that coyotes and other predators use packed snow trails to compete with lynx for prey, and the amount of compaction created by snowmobiles is insignificant compared to the compaction created naturally by the weather. They were particularly concerned that if such language was introduced into plans, it could be difficult to change, incrementally restricting the places where snowmobiling is allowed. Others wanted an allowance made to increase use. These comments were considered for management direction – see FEIS Vol. 1 pp. 90-93.

In their comments on the DEIS the FWS agreed it is prudent to maintain the status quo and restrict expansion of over-the-snow routes until more information is available because of the possibility that, over time, unregulated expansion could impair further conservation efforts. They also said current, ongoing research in Montana may shed some information on the effects of snow compaction on lynx. They suggested careful consideration of the most recent information and the reality of possible impairment of options for the future. They suggested considering language that could provide more guidance on conditions where the expansion of over-the-snow routes would be warranted and acceptable.

We reviewed the results of research conducted since the DEIS was released. In northwestern Montana (within the northern lynx core area) Kolbe et al. (in press) concluded there was "little evidence that compacted snowmobile trails increased exploitation competition between coyotes and lynx during winter on our study area." Kolbe et al. (in press) suggested that compacted snow routes did not appear to enhance coyotes' access to lynx and hare habitat, and so would not significantly affect competition for snowshoe hare. They found that coyotes used compacted snow routes for less than 8 percent of travel, suggesting normal winter snow conditions allowed access by coyotes, regardless of the presence or absence of compacted snow routes. Kolbe was able to directly measure relationships between coyotes, compacted snow routes and snowshoe hare in an area that also supports a lynx population (USDI FWS 2007). In this study coyotes primarily scavenged ungulate carrion that were readily

available while snowshoe hare kills comprised only three percent of coyote feeding sites (Kolbe et al. in press).

In the Uinta Mountains of northeastern Utah and three comparative study areas (Bear River range in Utah and Idaho, Targhee NF in Idaho, Bighorn NF in Wyoming) Bunnell (2006) found that the presence of snowmobile trails was a highly significant predictor of coyote activity in deep snow areas.

From track surveys it was determined the vast majority of coyotes (90 percent) stayed within 350 meters of a compacted trail and snow depth and prey density estimates (snowshoe hares and red squirrels) were the most significant variable in determining whether a coyote returned to a snowmobile trail (Bunnell 2006). Of the four study areas recent lynx presence has only been documented on the Targhee NF. Bunnell indicated that "circumstantial evidence" suggested the existence of competition.

To date, research has confirmed lynx and coyote populations coexist, despite dietary overlap and competition for snowshoe hare, the primary prey of lynx, and alternate prey species. In some regions and studies, coyotes were found to use supportive snow conditions more than expected, but none confirm a resulting adverse impact on lynx populations in the area. The best scientific information (Kolbe's study) is from an occupied core area within our planning area. Radio-collared lynx and coyotes were monitored in this study, unlike the Bunnell study. This area is occupied by both lynx and coyotes and the study concludes coyotes did not require compacted snow routes to access winter snowshoe hare habitat.

Based on this information, we reevaluated management direction related to over-the-snow activities. An alternative to prohibit all snow-compacting activities or to limit dispersed use was evaluated, but not considered in detail because current research indicates this level of management direction is unwarranted (USDI FWS 2000a; FEIS, Vol. 1, Appendices O and P).

An alternative to drop all direction limiting snow compaction was not developed in detail because there <u>is</u> evidence competing predators use packed trails, suggesting a potential effect on individual lynx. We decided it was prudent to maintain the status quo and not let over-the-snow routes expand. However, we also decided it was reasonable to retain the direction as a guideline in the selected alternative which can be used in project design. The intent is to follow the management direction in guidelines. However, there may be some cases where expansion of over-the-snow routes would be warranted and acceptable, or where research indicates there would be no harm to lynx. Guidelines are better suited to adaptive management.

There is also no basis to establish any particular threshold of allowable increases. However, the selected alternative allows expanding winter recreation in some places where heavy public use existed in 1998, 1999, or 2000 – see Guideline HU G11.

The FWS concluded the Objectives HU O1 and O3, and Guideline HU G11 would be sufficient to maintain habitat effectiveness for lynx by limiting the expansion of

compacted snow routes and this conclusion would be tested through monitoring required in this decision. The best information available has not indicated compacted snow routes increase competition from other species to levels that adversely affect lynx populations, and under the selected alternative the amount of areas affected by snow compacted routes would not substantially increase (USDI FWS 2007).

### **Developed recreation**

The LCAS identified risk factors associated with ski areas, including *short-term effects* on denning, foraging, and diurnal security habitat and *long-term effects* on movement within and between home ranges (LCAS, p. 2-10). Ski areas may eliminate habitat and pose a threat to movements; but most were constructed before lynx became a conservation issue (Hickenbottom et al. 1999, p. 70). Mitigation measures can be developed at the project level to lessen the effects of existing developments.

The LCAS recommended various objectives, standards, and guidelines in relation to developed recreation, specifically ski areas. These are reflected Alternative B, *Objectives ALL O1*, *HU O2*, *HU O3*, and *HU O4*; *Standards ALL S1 and HU S2*; and *Guidelines HU G1*, *HU G2*, *HU G3*, and *HU G10*. Objectives and standards (*LINK O1 and LINK S1*) regarding habitat connectivity also address concerns about developed recreation. These objectives, standards, and guidelines provide management direction about ski area development, expansion, and operations to provide for lynx movement, security, and habitat needs.

The alternatives retain similar management direction as Alternative B, except Alternatives C, D, and E changed Standard HU S2 to Guideline HU G10. Standard HU S2 requires diurnal habitat to be maintained, if needed. There is no evidence that diurnal security habitat is required by, or where it occurs on ski areas is used by lynx (USDI FWS 2007). Since the need to provide diurnal habitat is questionable, we determined it was better suited as a guideline.

In commenting on the DEIS some people said ski areas should be removed or at least prevented from expanding. Others recommended the final preferred alternative retain Standard HU S2. There are 24 existing down hill and cross country ski areas in occupied habitat in the planning area, which affect about 17,500 acres out of the 12.5 million acres of occupied habitat. Eight down hill ski areas are planned for expansion. One new ski area is proposed. Most of the ski areas are located on individual mountain ranges, not several together as in other areas in the west (FEIS, Vol. 1 p. 285). There is no indication these ski areas affect lynx travel because these ski areas are spread across the planning area. There is no information that indicates removal of ski areas is warranted, nor is limiting their expansion, as long as lynx needs are considered. The selected alternative includes standards to provide for lynx habitat connectivity, and includes guidelines to be use in the development of ski area expansion. Many adverse effects of developed recreation will be minimized under the selected alternative (USDI FWS 2007).

## Minerals and energy

The LCAS said the main risk factors associated with minerals and energy development is related to the potential for plowed roads to provide access for lynx competitors.

These recommendations are reflected in Alternative B, *Objectives ALL O1*, *HU O1*, *and HU O5*, *Standards ALL S1* and *HU S3*, and *Guidelines HU G4*, and *HU G5* which provide management direction for mineral and energy development. All except standard HU S3 remain essentially the same in all alternatives. Standard HU S3 says to keep mineral and energy development to designated routes. This standard was changed to Guideline HU G12 in Alternative E and in the selected alternative to be consistent with the application of management direction regarding over-the-snow routes discussed above.

In commenting on the DEIS some people said lease stipulations identifying constraints on developing oil and gas, coal, or geothermal resources should be one of the decisions made as a part of the management direction. This comment is addressed in the FEIS, Vol. 1 p. 94-95. FWS did not comment on the management direction related to minerals and energy development.

#### **Forest roads**

Lynx are known to have been killed by vehicle-collisions in Colorado (reintroduced population; paved, high-speed highways), in Minnesota (paved, high-speed highways) and in Maine (high-speed, relatively straight gravel roads on flatter terrain). The best information suggests that the types of roads managed by the Forest Service do not adversely affect lynx (USDI FWS 2007). Lynx mortality from vehicle strikes are unlikely, and to date none have been documented on National Forest System lands within the planning area, given the relatively slow speeds at which vehicles travel on these roads (due to topography and road conditions) and generally low traffic volumes.

Roads may reduce lynx habitat by removing forest cover. Along less-traveled roads where the vegetation provides good hare habitat, sometimes lynx use the roadbeds for travel and foraging (Koehler and Brittell 1990; LCAS, p. 2-12). A recent analysis on the Okanogan NF in Washington showed lynx neither preferred nor avoided forest roads, and the existing road density does not appear to affect lynx habitat selection (McKelvey et al. 2000; USDI FWS 2000a, p. 39).

Although many species of wildlife are disturbed when forest roads are used (Ruediger 1996), preliminary information suggests lynx do not avoid roads (Ruggiero et al. 2000) except at high traffic volumes (Apps 2000). In denning habitat, when roads are used during summer, lynx may be affected if they move their kittens to avoid the disturbance (Ruggiero et al. 2000; LCAS, p. 2-12).

The LCAS recommended several guidelines to address potential impacts of forest roads, including upgrading, cutting and brushing, and public use. These guidelines generally discourage improving access for people or reduce the likelihood people would see lynx near roads. These guidelines are reflected in Alternative B, *Guidelines* 

HU G6, HU G7, HU G8, and HU G9. All the alternatives, including the selected alternative retain these guidelines.

In commenting on the DEIS some people said more restrictions on roads were needed to conserve lynx. They wanted new road construction halted, road densities identified and existing roads closed or eliminated, or they wanted the roads guidelines turned into standards. Other people said there should be no road-related standards or guidelines, saying no evidence exists that roads harm lynx. Some people said Guideline HU G9 should be deleted because there are no compelling reasons to close roads. The FEIS, Vol. 1, pp. 95 to 96 describes how these were considered in the development of the management direction. FWS had no comments related to these guidelines.

Based on our review we found no information indicating road building should be banned or that further restrictions were needed. The guidelines adequately address the known risks associated with roads. We determined guidelines were the appropriate level of management direction because guidelines provide information and guidance for project design and decision-making. Some guidance on how to design projects is warranted because roads may affect individual lynx.

## Management direction related to linkage areas

#### Highways and connectivity

Highways impact lynx by fragmenting habitat and impeding movement. As traffic lanes, volumes, speeds, and rights-of-way increase, the effects on lynx are increased. As human demographics change, highways tend to increase in size and traffic density.

The LCAS recommended one objective, two standards, and a guideline directly or indirectly related to highways and connectivity. These are reflected in Alternative B, *Objective ALL O1, Standards ALL S1* and *LINK S1*, and *Guideline ALL G1*. Objective ALL O1 and Standard ALL S1 are intended to maintain connectivity. Standard LINK S1 is intended to provide a process for identifying wildlife crossings across highways.

Alternatives C, D, E and the selected alternative have the same objective and standards.

In comments on the DEIS some people said more should be done than just identifying highway crossings. FWS did not comment on management direction related to highways.

The LCAS recommended project standards for highways. It says to "Identify, map and prioritize site-specific locations, using topographic and vegetation features, to determine where highway crossings are needed to reduce highway impacts on lynx and other wildlife". Alternatives B, C, D, E and the selected alternative include Standard LINK S1 which reflects the intent of the LCAS recommendations. In addition, Guideline ALL G1 says "Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways or forest highways across federal land. Methods could include fencing, underpasses or overpasses."

As noted in Chapter 3, Transportation Section, portions of three highways are likely to be reconstructed in linkage areas in the next ten years. State agencies in Wyoming, Idaho, and Montana are incorporating wildlife crossings into their highway design packages (Wyoming Department of Transportation, 2005; Idaho Transportation Department 2004; Montana DOT, FHWA, Confederated Kootenai and Salish Tribes 2006). Therefore no further management direction regarding wildlife crossings in the form of standards was found to be warranted.

#### Other considerations in linkage areas

Coordination among different land management agencies is important to the recovery of lynx because lynx have large home ranges and may move long distances. The LCAS recommended guidance for working with landowners to pursue solutions to reduce potential adverse effects. This recommendation is reflected in Alternative B, *Objective LINK O1*. This objective is the same among all alternatives, including the selected alternative.

In addition, it is important to mention the Forest Service is a lead member in the interagency Lynx Steering Committee and the Lynx Biology Team (FEIS, Vol. 1 Chapter 4), and played a key coordination role for the Lynx Science Team. These efforts facilitate relationships with other Federal and non-Federal landowners, including the States and provide a source for non-Federal land management guidance, through products such as the LCAS and Forest Plans. The Steering Committee would also provide a forum to build and sustain cooperative efforts with Canada to maintain lynx connectivity across the international border, if and when the need arises (USDI FWS 2007). The Forest Service also led the interagency effort to identify linkage areas.

## Use of standards and guidelines

The selected alternative incorporates standards for those risk factors found to threaten lynx populations. Standards are management requirements used to meet desired conditions. Standards were used in those situations where we wanted to provide sideboards for project activities. Guidelines were used for those risk factors that may have possible adverse affects on individual lynx. Guidelines are management actions normally taken to meet objectives. They provide design criteria to meet lynx objectives. We expect guidelines to be followed in most cases, however based on site-specific conditions there may be reason not to follow a guideline.

FWS found guidelines would be implemented in most cases and adverse effects would not always occur where guidelines are not implemented. Effects would be based on site-specific conditions, with compliance with Section 7 consultation for each project. The FWS does not expect adverse effects as a result of changes of LCAS standards to guidelines to reach levels that impact lynx populations. Changes from standards to guidelines occurred when the best available information indicated the action was not likely to adversely affect lynx, or not likely to adversely affect lynx in most cases (i.e. where no conclusive or reliable information supported the standard in the LCAS).

Application of the standards, and for the most part guidelines, in core and occupied secondary areas substantively reduce the potential for adverse effects on lynx over the existing plans (USDI FWS 2007).

In addition, we will monitor the application of guidelines to see if our assumption they are normally applied is correct. Annually we will review the monitoring results to determine if further consideration is warranted.

### Where to apply the decision

The selected alternative is incorporated into all forest plans in the planning area (FEIS, Vol. 1, Table 1-1 p. 5 and Figure 1-1). However, the management direction only applies to occupied lynx habitat. Those National Forests (the Beaverhead-Deerlodge, Bitterroot, Nez Perce in Region 1; the Bighorn in Region 2; and the Ashley, and Salmon-Challis in Region 4), or isolated portions of National Forests (the Custer, Gallatin, Helena and Lewis and Clark in Region 1), that presently are unoccupied by Canada lynx should consider the management direction that is now incorporated into their Forest Plans when developing projects, but are not required to follow the management direction until such time as they are occupied by Canada lynx.

According to the Conservation Agreement (USDA FS, USDI FWS 2006a), an area is considered occupied when: (1) there are at least 2 verified lynx observations or records since 1999 on the national forest, unless they are verified to be transient individuals; or (2) there is evidence of reproduction on the national forest.

This direction is in keeping with the current Conservation Agreement which only applies to projects and activities in occupied habitat. The FWS species lists on those forests and portions of forests that are unoccupied do not show lynx as a species for consideration. However, as noted in the Biological Opinion, the FWS said, and we agree that lynx detection is needed to assess whether further management direction is warranted (USDI FWS 2007). Therefore, we agree to work with the FWS to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary areas as described in the Biological Opinion, Term and Condition #4.

## Incorporation of terms and conditions

On March 16, the FWS issued its Biological Opinion on the Northern Rockies Lynx Management Direction (USDI FWS 2007). In the opinion the FWS concluded that the management direction would overall be beneficial, but that some adverse effects to lynx would still be anticipated. It determined the management direction would not jeopardize the continued existence of lynx. The opinion also provides an incidental take statement which specifies the impact of any incidental taking of lynx. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions which must be complied with in order to implement the reasonable and prudent measures.

The opinion identified three reasonable and prudent measures (RPM) with four associated terms and conditions (TC). We incorporated TC 1 through 3 into the management direction. The TCs are shown in italics in Attachment 1. TC #4 is agreed to as described below.

RPM #1: Minimize harm from fuels management by ensuring the acres impacted are not concentrated in a geographic area or several adjacent LAUs

Ensure fuels management projects conducted under the exemptions from Standards VEG S1, S2, S5 and S6 in occupied habitat:

- TC 1. do not occur in greater than 6 percent of lynx habitat on any forest; and
- TC 2. do not result in more than 3 adjacent LAUs not meeting the VEG S1 standard.

TC 1 was already part of the management direction. TC 2 has been added to Standard VEG S1.

RPM #2: Minimize harm from precommercial thinning and vegetation management by ensuring that LAUs either retain sufficient foraging habitat, or do not substantially reduce foraging habitat.

TC 3. In occupied habitat, precommercial thinning and vegetation management projects allowed per the exceptions listed under VEG S5 and S6, shall not occur in any LAU exceeding VEG S1, except for projection of structures. This requirement has been added to Standards VEG S5 and VEG S6.

RPM #3: On those Forests with currently unoccupied lynx habitat, lynx detection is needed to assess whether further management direction is warranted, including application of the management direction.

TC 4. Within 18 months of the date of the Biological Opinion, the Forest Service shall work with the Service to develop and complete an acceptable protocol to survey currently unoccupied lynx habitat in secondary areas. We agree to work with the FWS to develop and complete the protocol in unoccupied secondary areas.

The FWS also identified several monitoring and reporting requirements related to the above terms and conditions. We have incorporated these elements in the selected alternative – see Attachment 1, page 9.

#### **Consideration of conservation recommendations**

The FWS also identified three conservation recommendations which are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information.

Recommendation 1. The FS should ensure to the extent possible, that unoccupied habitat continues to facilitate and allow dispersal of lynx into the future. Therefore the

FWS recommends the management direction regarding linkage areas and connectivity by applied in the unoccupied areas (ALL O1, ALL S1, ALL G1; LINK O1, LINK S1 and LINK G1). The Forest Service already considers and applies this management direction in our current program of work; therefore we have decided to not apply the direction in unoccupied areas until such time the areas are occupied.

Habitat connectivity is considered in the design of permanent developments and vegetation management. Few, if any, vegetation projects affect habitat connectivity. Most, if not all units, have some level of riparian area protection requirements in their existing plans. This direction facilitates movement of lynx through riparian areas.

The greatest risk to impeding connectivity is in relation to roads and highways. The Forest Service already works with the State and Federal Highway agencies and is part of the steering team that produced the document *Eco-logical: An Ecosystem Approach to Developing Infrastructure Projects* (USDOT, 2006), FEIS Transportation Section. Also noted in this section is the highway work planned and projected in all lynx habitat and how the states have incorporated wildlife crossings into the design of those future projects. The FEIS p. 198 evaluated the effects of not applying the management direction to unoccupied areas and discloses that there would be minimal effects, especially to linkage areas because similar management direction or the intent of the direction already exists.

Recommendation 2. The Forest Service should coordinate with the Service to develop, within 18 months a method to monitor the amount and condition of lynx habitat in unoccupied secondary habitat. The Forest Service agrees to this recommendation.

Recommendation 3. The Forest Service should continue to be a leader in lynx conservation and understanding. The Forest Service agrees to this recommendation.

## **Canada Lynx Recovery Outline**

On September 12, 2005 the FWS issued a Recovery Outline for Canada lynx (USDI FWS 2005). The outline is to serve as an interim strategy to guide and encourage recovery efforts until a recovery plan is completed. In the Recovery Outline, FWS categorized lynx habitat as: 1) core areas; 2) secondary areas; and 3) peripheral areas. The areas with the strongest long-term evidence of the persistence of lynx populations within the contiguous United States are defined as "core areas." As we discuss below and illustrated on the enclosed map (Figure 1-1), we have two core areas in the analysis area. Core areas have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. According to FWS, focusing lynx conservation efforts on these core areas will ensure the continued persistence of lynx in the contiguous United States by addressing fundamental principles of conservation biology (USDI FWS 2007). The Recovery Outline says "Recovery of lynx will be achieved when conditions have been attained that will allow lynx populations to persist long-term within each of the identified core areas." (USDI FWS 2005).

At this time, the role of areas outside of these core areas in sustaining lynx populations is unclear. The fluctuating nature of lynx population dynamics and the ability of lynx to disperse long distances have resulted in many individual occurrence records outside of core areas, without accompanying evidence of historic or current presence of lynx populations. Areas classified as "secondary areas" are those with historical records of lynx presence with no record of reproduction; or areas with historical records and no recent surveys that document the presence of lynx and/or reproduction. We have one area of secondary habitat in the analysis area (Figure 1-1). Much of the secondary habitat is unoccupied. FWS hypothesizes that secondary areas may contribute to lynx persistence by providing habitat to support lynx during dispersal movements or other periods, allowing animals to then return to "core areas."

In "peripheral areas" the majority of historical lynx records are sporadic and generally corresponds to periods following cyclic lynx population highs in Canada. There is no evidence of long-term presence or reproduction that might indicate colonization or sustained use of these areas by lynx. However, some of these peripheral areas may provide habitat enabling the successful dispersal of lynx between populations or subpopulations. We have four areas of peripheral habitat in the analysis area (Figure 1-1). At this time, FWS does not have enough information to clearly define the relative importance of secondary or peripheral areas to the persistence of lynx in the contiguous United States (USDI FWS 2005, USDI FWS 2007).

In the Recovery Outline, FWS presented four preliminary recovery objectives. Below, we summarize FWS findings (USDI FWS 2007) of how the selected alternative meets the recovery objectives.

**Preliminary recovery objective 1:** Retain adequate habitat of sufficient quality to support the long-term persistence of lynx populations within each of the identified core areas.

FWS concludes the selected alternative fulfills this objective and adequately manages the two core areas within the planning area to support lynx recovery. The selected alternative supports the long-term persistence of lynx populations within the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas, which constitutes one third of the core areas nationwide (USDI FWS 2007).

**Preliminary recovery objective 2:** Ensure that sufficient habitat is available to accommodate the long-term persistence of immigration and emigration between each core area and adjacent populations in Canada or secondary areas in the United States.

FWS concludes the selected alternative contributes to this recovery objective in part.

Lynx have the ability to move great distances, through varied terrain and habitat. Dispersing lynx use a variety of habitats and prey resources compared to lynx attempting to establish a home range and territory (USDI FWS 2007).

Connectivity between the United States and Canada appears intact thus far, as the Northwestern Montana/Northeastern Idaho core area is directly adjacent to Canada

and includes Glacier Park along its northeastern edge. The selected alternative provides and conserves core area lynx habitat directly adjacent to and contiguous with lynx habitat in Canada. Such habitat should accommodate both immigration of lynx from Canada and emigration from core areas to secondary areas or Canada.

The selected alternative applies to all core areas and occupied secondary areas. The direction includes objectives, standards, and guidelines to actively maintain or restore lynx habitat connectivity in and between linkage areas and LAUs (lynx home ranges). Because these measures apply in both core and occupied secondary areas, the selected alternative clearly meets the recovery objective of accommodated long-term connectivity across these broad areas.

The selected alternative is less clear in its effects in unoccupied secondary areas between the Northwestern Montana/Northeastern Idaho and Greater Yellowstone core areas. The management direction will not be applied to these areas until they become occupied. In the meantime existing plan direction will be followed.

Information indicates the likely impact of projected vegetation management on connectivity in this area may not be excessive. Fuel treatment projects in unoccupied habitat would likely occur in no more than two to three percent of all lynx habitat on any forest in secondary areas (FEIS Vol. 1, p. 195, USDI FWS 2007). In unoccupied areas precommercial thinning could occur on about 67,000 acres (about 1 percent) with full funding and 23,000 acres (0.4 percent) or less with projected funding. Timber harvest in unoccupied areas could result in creating stand initiation openings in more than 30 percent of an LAU. However, very few LAUs exceed this amount now and those that were in excess were in that condition due to past wildfires (FEIS, Vol. p. 155). Information regarding projected timber harvest was not available, but based on the past harvest history (Project File/Forests/FEIS/Data) it is unlikely regeneration harvest will occur to the same levels it did historically (1970s and 1980s). Based on this, FWS found vegetation management, under existing plan direction, would not preclude connectivity or opportunistic foraging conditions (USDI FWS 2007).

Development is another factor that may impede lynx movement. Four ski areas, affecting about 3,800 acres occur on National Forest System lands, in unoccupied secondary habitat; two of the four are planning expansions. None of these ski areas impede connectivity of lynx habitat at this time (USDI FWS 2007).

Connectivity for lynx could be more impacted by development such as highway expansions. Under existing plans and national efforts, methods to provide for safe wildlife crossings are currently being researched by all state highway departments and are being incorporated into highway improvements (FEIS, Vol. 1 p. 294-295).

In secondary unoccupied habitat, units should consider the management direction until such time the area becomes occupied. Given the estimates of projected impacts and the best information available regarding lynx dispersal movements, FWS concluded that under existing plan direction, these unoccupied secondary areas would reasonably be

expected to provide adequate connectivity and opportunistic foraging habitat for lynx to allow dispersal (USDI FWS 2007).

**Preliminary recovery objective 3:** *Ensure habitat in secondary areas remain available for continued occupancy by lynx.* 

FWS found the selected alternative contributes to this recovery objective in part.

The recovery outline discusses the relative importance of core and secondary areas to lynx recovery. The selected alternative will fully provide management direction in occupied lynx habitat – both core and secondary. This measure ensures habitat in currently occupied secondary habitat remains available for continued occupancy by lynx.

The forests should consider the management direction in currently unoccupied secondary habitat. As noted in Objective 3, management actions could adversely affect unoccupied secondary lynx habitat. If and when lynx attempt to establish home ranges in secondary areas, individual lynx could be affected. It is also important to note that about 70 percent of unoccupied secondary lynx habitat in the planning area is in roadless or wilderness status where forest management actions are minimal and natural processes predominate.

Occupancy could occur if lynx populations in core areas were to expand, as periodically happens in lynx populations in Canada. However, given the projected impacts described in Objective 3, non-developmental areas, and existing habitat conditions, FWS believes it is reasonable to expect some lynx would occupy these secondary areas despite lack of mandatory direction in plans, but at a lower density than core. Further, if detected, once lynx occupy a previously unoccupied area, the management direction will apply. In the meantime, our vegetation management actions may degrade lynx habitat, but resulting conditions are typically temporary, not permanent. The risks of most vegetation management actions, such as timber harvest, precommercial thinning and other modifications of habitat, are reversible since typically forests regenerate overtime, with or without active restoration. Based on this FWS found lynx habitat on National Forests System lands in secondary areas will likely remain available for recovery of lynx over time (USDI FWS 2007).

The Opinion goes on to say the selected alternative does not fulfill Objective 3 entirely, as it lacks requirements for further or continued monitoring or surveying of unoccupied secondary areas for the amount and condition of lynx habitat and lynx presence, as recommended in the recovery outline.

However, through this decision we agree to work with the FWS to develop and complete a protocol to survey and to develop a method to monitor the amount and condition of lynx habitat in unoccupied secondary habitat. Our agreement to these items will aid in fulfilling Objective 3.

**Preliminary recovery objective 4:** *Ensure threats have been addressed so that lynx populations will persist in the contiguous United State for at least the next 100 years.* 

FWS found that although plans do not apply for 100 years and thus cannot directly fulfill this objective, the selected alternative will allow lynx populations to persist on lands within core areas in the planning area within the foreseeable future. The selected alternative addresses the threat to the distinct population segment (DPS), inadequate regulatory measures, within core areas in the planning area by limiting, reducing or avoiding major adverse impacts of federal land management on lynx, as well as several other impacts or influences that do not rise to the level of a threat to the DPS. Further, a large portion of lynx habitat within the planning area (67 percent) remains in non-developmental status, where natural processes predominate. Finally, unoccupied lynx habitat within secondary and peripheral lynx areas is likely to retain habitat that provides opportunistic foraging habitat and connectivity adequate for dispersal of lynx, despite the lack of specific direction for lynx habitat management (USDI FWS 2007).

# Findings Required by Laws, Regulation, and Policies

### **National Environmental Policy Act**

The National Environmental Policy Act (NEPA) requires analysis of decisions to ensure the anticipated effects on the environment within the analysis area are considered prior to implementation (40 CFR 1502.16). The analysis for the Northern Rockies Lynx Management Direction followed the NEPA guidelines as provided by the Council on Environmental Quality. Alternatives were developed based on the Purpose and Need, the primary issues, public comments, lynx needs as identified by the LCAS, research, and other publications. A total of six alternatives were considered in detail, including the No Action Alternative as required by NEPA (FEIS, pp. 26 to 69 and 107 to 134). Additional management direction was considered but eliminated from detailed study (FEIS, pp. 71 to 106). The range of alternatives is appropriate given the scope of the proposal, the public issues expressed, and the Purpose and Need for action (FEIS, Chapter 1).

#### Unavoidable adverse effects

The selected alternative does not represent an irreversible or irretrievable commitment of resources. Any disturbance to resources cannot occur without further site-specific analyses, section 7a consultation required under ESA and decision documents. For a detailed discussion of effects of this decision, see Chapter 3 of the FEIS (pp. 135 to 350).

#### Environmentally preferable alternative(s)

Regulations implementing NEPA require agencies to specify "the alternative or alternatives which are considered to be environmentally preferable" (40 CFR 1505.2(b)). The environmentally preferable alternative causes the least damage to the biological and physical environments and best protects, preserves, and enhances historical,

cultural, and natural resources. Based on the description of the alternatives considered in detail in the FEIS and in this ROD, we determined the selected alternative best meets the goals of Section 101 of the NEPA, and is therefore the environmentally preferable alternative for this proposed federal action.

FWS found timber harvest can be beneficial, benign, or detrimental depending on harvest method, and the spatial and temporal occurrence on the landscape (FEIS, Vol. 1, Appendix P). The vegetation standards in the selected alternative ensure the timber management program is beneficial to lynx. Standard VEG S1 limits the amount of lynx habitat that is in the stand initiation stage to 30 percent of each LAU at any time, ensuring a continuous rotation of all forest stages through time that supply lynx habitat in each LAU (FEIS, Vol. 2, p. 60). Standard VEG S2 allows no more the 15 percent of the lynx habitat to change to the stand initiation stage through timber harvest in a 10-year period. This limits the rate of change within an LAU to ensure sufficient habitat for lynx through time.

Precommercial thinning can impact lynx habitat. Standard VEG S5 precludes precommercial thinning except in certain situations that FWS has determined would have little effect upon lynx or their habitat, but would advance natural ecological conditions (FWS comment letter on the DEIS, pp. 8 and 9). While these exceptions have little effect on lynx (0.5 percent of lynx habitat) they have important positive impacts on other resources and situations such as maintaining aspen, western white pine, and whitebark pine, and fuel reduction near buildings.

Since the LCAS was published it has become clear that multistory mature stands with dense horizontal cover are important to lynx. In the selected alternative, Standard VEG S6 is instrumental in maintaining winter snowshoe hare habitat in multistoried forests which will aid in lynx persistence.

The selected alternative allows for management of fuels in the WUI under Guideline VEG G10, rather than standards. Under VEG G10 fuel reduction projects in the WUI should consider the VEG standards, but may deviate from them, up to a cap of 6 percent of the lynx habitat on each National Forest. Lynx habitat is still considered; however, if the fuel reduction needs are such that any of the four VEG standards cannot be met while at the same time meeting fuel treatment objective, the project may proceed under Guideline VEG G10. Fuel treatment actions in 94 percent of the lynx habitat must follow the VEG standards, while at the same time fuel treatment projects in the WUI can protect other valuable resources.

The selected alternative contains guidelines for the various activities on National Forest System land that may have possible adverse affects on individual lynx. Standards were changed to guidelines when the best available information indicated the action was not likely to adversely affect lynx, or not likely to adversely affect lynx in most cases (i.e. where no conclusive or reliable information supported the standard in the LCAS).

The selected alternative contributes to lynx conservation and recovery on National Forest System lands, but allows for management of other resources. Considering all this, the selected alternative is the environmentally preferred alternative because it causes the least damage to the biological and physical environments and best protects, preserves, and enhances natural resources.

#### **National Forest Management Act**

*Significance determination:* The purpose of this proposal is to incorporate management direction into plans for the conservation and recovery of Canada lynx.

In January 2005, the Forest Service removed the November 9, 2000 National Forest System Land and Resource Management Planning Regulations at 36 CFR 219, subpart A and replaced them with newly adopted regulations. The new regulations set forth a process for land management planning, including the process for developing, amending, and revising land management plans (36 CFR 219.1). These regulations also incorporate effective dates and transition periods. Section 219.4(e) says "Plan development, plan amendments or plan revision initiated before the transition period (starting January 5, 2005) may continue to use the provisions of the planning regulations in effect before November 9, 2000" – in this case the 1982 regulations. This proposal was initiated on September 11, 2001, which is before the transition period; therefore it is being completed under the requirements of the 1982 regulations.

The National Forest Management Act (NFMA) provides that forest plans may be amended in any manner, but if the management direction results in a significant change in the plan, the same procedure as that required for development and approval of a plan shall be followed. The 1982 regulations at 36 CFR 219.10(f) requires the agency to determine whether or not a proposed amendment will result in a significant change in the plan. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, then the agency may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures.

Forest Service Manual (FSM) 1920, section 1926.5 (Jan. 31, 2006) identifies factors to consider in determining whether an amendment is significant or non-significant for those plans using planning regulations in effect before November 9, 2000.

Changes to the land management plan that are not significant can result from:

- 1. Actions that do not significantly alter the multiple-use goals and objectives for long-term land and resource management.
- 2. Adjustments of management area boundaries or management prescriptions resulting from further on-site analysis.
- 3. Minor changes in standards and guidelines.
- 4. Opportunities for additional projects or activities.

Examples of significant changes include:

- 1. Changes that would significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.
- 2. Changes that may have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

The selected alternative will change in plans similar to examples of non-significant changes #1 and #3. The effects of this decision are not similar to either example of significant plan changes. These findings are discussed in further detail below.

Under the selected alternative the management direction will only apply to occupied habitat. At this time the Beaverhead-Deerlodge, Bitterroot, Nez Perce, Salmon-Challis, Ashley and Bighorn NFs are unoccupied; therefore these units should consider the management direction but will not have to apply it. Several mountain ranges on the Custer, Gallatin, Helena, and Lewis and Clark NFs are also unoccupied and the management direction will not have to be applied in these areas until lynx occupy the site. However, since the selected alternative could be applied to all units at some point in time, the following analyzes the effects on the planning area as a whole.

Changes in standards and guidelines are minor

The selected alternative adds one goal to forest plans; conserve Canada lynx. This goal is consistent with other goals in existing plans and other legal requirements to provide for habitat needs for threatened and endangered species. The selected alternative adds several objectives to the plans. These objectives require consideration of natural ecosystem process and functions, and consideration of lynx habitat needs. The additional objectives provide more species-specific guidance but do not alter the overall objectives to provide for habitat needs for threatened and endangered species. The proposal does not change any Management Area (MA) designation.

The selected alternative adds seven standards and twenty-four guidelines. The addition of these new standards and guidelines are minor as discussed below.

Changes would not significantly alter the long-term relationship between levels of multiple-use goods and services originally projected.

The management direction would not substantially alter outputs for grazing, minerals, energy, transportation systems, developed recreation areas, such as ski areas or winter recreation. These activities will not be prohibited by the management direction; however, habitat needs for lynx will need to be considered when managing these resources. The new direction will also not substantially alter timber outputs, even though it may affect growth and yield.

The selected alternative limits precommercial thinning in winter snowshoe hare habitat in young regenerating forests, with some exceptions – see Standard VEG S5. Precommercial thinning is allowed to restore aspen, whitebark pine and planted rust-

resistant western white pine. Precommercial thinning will also be allowed if new research indicates it will benefit or only have short-term adverse effects to lynx. Precommercial thinning is not allowed in young regenerating lodgepole pine forests, unless new research indicates it is beneficial or benign. Limiting precommercial thinning in lodgepole pine forests could affect growth and yield, and the potential to produce some products in the future, because these forests tend to stop growing if not thinned; however overall cubic foot volume would not be affected.

The Beaverhead-Deerlodge and the Bridger-Teton are the only units that have a majority of their precommercial thinning identified over the next ten years in lynx habitat and in lodgepole pine; therefore they are the only units that could see a reduction to growth and yield (FEIS, Vo1. 1, Appendix K-5). Under current programs, the units only have accomplished a portion of their thinning program (approximately 34 percent) due to budgets, so it is difficult to tease out the effects from the management direction in this proposal from effects of budgets. In addition, Standard VEG S5 allows for consideration of new information. Over the next ten to fifteen years information may become available that indicates some precommercial thinning in lodgepole pine forests may be beneficial to snowshoe hare (see DEIS comment letter #505).

Limiting precommercial thinning is unlikely to affect long-term sustained yield (LTSY), as defined by NFMA and FSH 1909.12, Chapter 60.5, because the cubic foot volume on the site does not substantially change. The volume is spread among more, smaller trees without thinning versus fewer, larger diameter trees with thinning. In addition, some precommercial thinning may be allowed in the future if new information becomes available. Timber outputs have never been at the level of LTSY over the life of these plans, so changes in LTSY are unlikely to lead to changes in outputs, especially if outputs are measured in cubic feet, which is the appropriate measure of LTSY.

In addition, the ASQ should not be affected on any units because the management direction does not preclude timber harvest. Standards VEG S1 and S2 may defer regeneration harvest in some areas, but Guideline VEG G1 encourages projects creating winter snowshoe hare habitat where it is lacking. It is likely there would be no change in overall timber outputs, but there may be changes in what material is harvested and where.

Changes would not have an important effect on the entire land management plan or affect land and resources throughout a large portion of the planning area during the planning period.

There are approximately 38.5 million acres within the 18 National Forests in the planning area. Of this, approximately 18 million acres or 48 percent has been mapped as lynx habitat (see table 3.1). Of the 18 million acres of mapped lynx habitat, approximately 8 million acres are in land allocations that allow for management actions. Therefore the management direction only potentially affects about 20 percent of the planning area. The most noticeable effects are likely to be the location and amount of precommercial thinning. The potential acreage that could be affected is between 11,000 to 15,000 acres per year. This is less than one percent of the planning area. It should be

noted that precommercial thinning is not constrained on an additional 18,000 acres per year outside lynx habitat (FEIS, Vol. 1 p 247-248).

**Summary:** Considering the three factors, we determined this management direction is not a significant change under NFMA to the 18 forest plans because it imposes minor changes over a limited area of these national forests.

While this amendment is not significant, the planning process necessary for significant amendments is ongoing or will begin soon on most units affected by this decision. In particular interest to the precommercial thinning discussion on the previous page, both the Beaverhead-Deerlodge and Bridger-Teton National Forests are being revised. The Beaverhead-Deerlodge should complete the revision process in 2007. Their DEIS for the Forest Plan recognizes the cumulative contribution the Northern Rockies Lynx Amendment may have on reducing growth and yield (DEIS, page 326). The Bridger-Teton should complete its revision in 2008.

**Viability determination:** This management direction is being adopted in accordance with the 1982 NFMA regulations for amending land and resource management plans. Plan amendments initiated before January 5, 2005 may proceed using the provisions of these regulations. The transition period to regulations implementing the 2005 planning rule ends on a unit's establishment of an Environmental Management System, or no later than January 7, 2008.

According to the 1982 NFMA regulations, fish and wildlife habitat shall be managed to maintain viable populations of Canada lynx in the planning area (36 CFR 219.19, 2000). For the purpose of this decision, the planning area is the range of lynx encompassed by the national forests subject to this decision. This is based on a biological delineation of the Northern Rockies made in the LCAS.

A viable population is, "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well-distributed in the planning area." It is not possible to reliably predict future population demographics for lynx, and continued existence of lynx may be dependent on threats that exist outside of the planning area (health of Canadian populations, or linkage across other ownerships).

The national forests subject to this new direction will provide habitat to maintain a viable population of lynx in the Northern Rockies by maintaining the current distribution of occupied lynx habitat, and maintaining or enhancing the quality of that habitat. Based on the best scientific information available, and for the specific reasons provided below, this management direction will provide habitat to support persistence of lynx in the Northern Rockies in the long-term.

The LCAS was used as the basis for developing the selected alternative. The FWS Remand Notice (FEIS, Vol. 1, Appendix P), and other new information and research were also evaluated, and became the basis for updating standards and guidelines based upon the current state of knowledge regarding threats to lynx since the LCAS was compiled.

The greatest threats to lynx persistence and reproduction are from changes in vegetation structures that provide snowshoe hare habitat during summer and winter. Standards were developed under the selected alternative to provide direction for a variety of vegetation management activities that are most likely to affect lynx habitat (fuel treatments, precommercial thinning, timber harvest, etc.). These include standards for connectivity (ALL S1), habitat mapping (LAU S1), regeneration harvesting (VEG S2), precommercial thinning (VEG S5), and management of multistory mature and late successional forests (VEG S6). These standards are equal to or more protective than similar recommendations provided in the LCAS. In the Seeley Lake area of Montana, mature, spruce-fir forests with high horizontal cover are particularly important as winter foraging habitat and are more important than younger stands (Squires pers. com., Oct. 30, 2006) and the LCAS provides no specific management recommendations for these vegetative conditions within lynx habitat.

All of the core and secondary lynx habitat (100%) as defined in the *Recovery Outline* (USDI FWS 2005) that is occupied by lynx as defined in the *Occupied Mapped Lynx Habitat Amendment to the Canada Lynx Conservation Agreement* (USDA FS and USDI FWS 2006a) will be managed to conserve lynx.

The value of secondary habitat is unclear. The *Recovery Outline* (UDSI FWS 2005) states "Compared to core areas, secondary areas have fewer and more sporadic current and historical records of lynx and, as a result, historical abundance has been relatively low. Reproduction has not been documented." There currently is no evidence that suggest that unoccupied secondary habitat is considered necessary for a viable population of lynx. Secondary, unoccupied lynx habitat will have management direction implemented to conserve lynx if and when those administrative units become occupied. These National Forests (Beaverhead-Deerlodge, Bitterroot, Salmon-Challis and Nez Perce) which have secondary, unoccupied lynx habitat account for only about 30 percent of the total acres of core and secondary lynx habitat.

Even though the 6 percent limit (reflected in the vegetation standards) does not currently apply to unoccupied lynx habitat, those unoccupied forests would treat an average of 3.2 percent of lynx habitat within the WUI for fuel reduction over the next ten years (FEIS, Vol. 1, Lynx Section, and Appendix M). This is well below the 6 percent cap provided in the Biological Opinion (USDI FWS 2007). Overall fuel treatments, in and outside the WUI, in lynx habitat, average 5 percent within lynx habitat on these Forests.

In addition, The FWS Biological Opinion (2007) concluded that the proposed action is not likely to jeopardize the continued existence of lynx within the contiguous United States DPS. It also found the selected alternative will allow lynx populations to persist on lands in occupied core and secondary areas within the foreseeable future, and unoccupied secondary and peripheral habitat is likely to retain habitat that provides opportunistic foraging habitat and connectivity adequate for dispersal of lynx, despite the lack of specific direction for lynx management. The opinion goes on to say the

incorporation of the management direction over the large geographic area occupied by lynx within 12 of the 18 National Forests (12,150,000 acres) contributes to the landscape level direction necessary for the survival and recovery of lynx in the northern Rockies ecosystem.

## **Endangered Species Act**

The Endangered Species Act creates an affirmative obligation "... that all federal departments and agencies shall seek to conserve endangered and threatened species" of fish, wildlife, and plants. This obligation is further clarified in a National Interagency Memorandum of Agreement (August, 2000) which states our shared mission is to "... enhance conservation of imperiled species while delivering appropriate goods and services provided by the lands and resources."

We completed biological assessments (BAs) for all listed species; one for wildlife and fish, and one for plants. For all listed species, except for Canada lynx, we determined the preferred alternative would have "no effect" or would be "not likely to adversely affect" them. The determination for Canada lynx was that, while the management direction in selected alternative would improve lynx conservation, the plans amended by selected alternative would still be "likely to adversely affect" lynx because individuals could be adversely affected as a result of the exemptions and exceptions to the vegetation standards for fuel treatments projects and precommercial thinning. The BAs were submitted to the FWS. The FS consulted with the FWS on the determinations and they concurred with the "no effect" and "not likely to adversely affect" determinations. The FWS provided written review as required by Section 7 of the ESA (USDI FWS 2007).

FWS issued a Biological Opinion on the "likely to adversely affect" determination on lynx (USDI FWS 2007). The opinion acknowledges the beneficial and adverse effects of the selected alternative. The opinion states that given the large number of acres covered by the proposed action, the existing plan language, and the beneficial effects of the management direction in the balance of these acres, the selected alternative is likely to have overall beneficial effects to lynx by addressing the primary threat identified at the time of listing: the inadequacy of existing regulatory mechanisms. Even acknowledging some adverse effects could still occur, primarily due to the allowance for fuel treatment projects and precommercial thinning, the opinion found the selected alternative is not likely to jeopardize the continued existence of Canada lynx. The Opinion identifies incidental take and reasonable and prudent measure, with associated terms and conditions to reduce take. These measures have either been incorporated into the management direction (TC 1, 2, and 3) or agreed to in this decision (TC 4).

Further section 7a consultation will occur on future site-specific projects and activities if they result in adverse affects to lynx. Future consultation will reference back to the BO issued on this decision to ensure the effects of the specific projects are commensurate with the effects anticipated in the opinion issued on this decision (USDI FWS 2007).

#### Critical habitat

On November 9, 2006, FWS published the final rule for the designation of Canada lynx critical habitat (Federal Register, Vol. 71, No. 217, pp. 66008 to 66061). National Forest System lands were not included in the critical habitat designation. There is no adverse modification to designated critical habitat from implementation of selected alternative.

#### **National Historic Preservation Act**

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of cultural resources. It is our determination this plan direction complies with the National Historic Preservation Act and other statutes that pertain to the protection of cultural resources.

#### Clean Air Act

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of air quality. It is our determination this plan direction complies with the Clean Air Act and other statutes that pertain to the protection of air quality.

#### **Clean Water Act**

This decision is a programmatic action and does not authorize site-specific activities. Projects undertaken following the management direction will comply fully with the laws and regulations that ensure protection of water quality. It is our determination this plan direction complies with the Clean Water Act and other statutes that pertain to the protection of water quality.

## **Invasive Species (Executive Order 13112)**

Executive Order 13112 directs federal agencies not to authorize any activities that would increase the spread of invasive species. This decision is a programmatic action and does not authorize site-specific activities. We determined this plan direction complies with Executive Order 13112.

## **Environmental Justice (Executive Order 12898)**

Executive Order 12898 directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. We determined from the analyses disclosed in the FEIS that this plan direction complies with Executive Order 12898.

#### Prime Farmland, Rangeland, and Forest Land

We determined from the analyses disclosed in the FEIS that prime farmland, rangeland, and forest land will not be affected by this decision because the selected alternative is a programmatic action and does not authorize site-specific activities.

## **Equal Employment Opportunity, Effects on Minorities, Women**

The FEIS describes the impacts to social and economic factors in Chapter 3. The selected alternative will not have a disproportionate impact on any minority or low-income communities. We determined the selected alternative will not differentially affect the civil rights of any citizens, including women and minorities.

## Wetlands and Floodplains (Executive Orders 11988 and 11990)

The selected alternative is a programmatic action and does not authorize site-specific activities. We determined the selected alternative will not have adverse impacts on wetlands and floodplains and will comply with Executive Orders 11988 and 11990.

## Other policies

The existing body of national direction for managing National Forest System lands remains in effect.

# Implementation and appeal provisions

The management direction will become effective 30 days after publication of the notice of availability of the FEIS in the Federal Register. Requests to stay implementation of the amended plans shall not be granted pursuant to 36 CFR 217.10.

This decision is subject to review pursuant to 36 CFR 217.3 (available at http://www.fs.fed.us/r1/planning/lynx.html). Any appeals must be postmarked or received by the Appeal Reviewing Officer within 45 days of the date the legal notices are published in the The Missoulian, the newspaper of record.

Appeals sent through the US Postal Service must be sent to:

USDA Forest Service Attn: EMC Appeals Mail Stop 1104 1400 Independence Ave., SW Washington, DC 20250-1104

Appeals sent through FedEx, UPS, or a courier service must be sent to:

USDA Forest Service

**Ecosystem Management Coordination** 

Attn: Appeals Yates Bldg., 3CEN 201 14th Street, SW Washington, DC 20250 Appeals may be hand-delivered to the above address during regular business hours, 8:00 AM to 4:30 PM Monday through Friday, excluding holidays; or sent by fax to (202) 205-1012; or by email to <a href="mailto:appeals-chief@fs.fed.us">appeals-chief@fs.fed.us</a>. Emailed appeals must be submitted in rich text format (.rtf) or Word (.doc) and must include the decision name in the subject line. Any notice of appeal must be fully consistent with 36 CFR 217.9 and include at a minimum:

- A statement that the document is a Notice of Appeal filed pursuant to 36 CFR Part 217;
- The name, address, and telephone number of the appellant;
- Identify the decision to which the objection is being made;
- Identify the document in which the decision is contained, by title and subject, date of the decision, and name and title of the Deciding Officer;
- Specifically identify the portion(s) of the decision or decision document to which objection is made;
- The reasons for the appeal, including issues of fact, law, regulation, or policy and, if applicable, specifically how the decision violates law, regulation, or policy; and
- Identification of the specific change(s) in the decision that the appellant seeks.

# Further information and contact person

The Northern Rockies Lynx Management Direction FEIS, the Summary, this ROD and the FWS Biological Opinion, as well as other background documents are available on the Web at http://www.fs.fed.us/r1/planning/lynx.html.

For further information regarding the FEIS, ROD, or the plan direction for Canada lynx contact:

Timothy Bertram, Lynx Coordinator USDA Forest Service, Northern Region P.O. Box 7669 Missoula, MT 59807 Telephone: (406) 329-3611 I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction Into the Land and Resource Management Plans for the Bighorn and Shoshone National Forests in the Rocky Mountain Region of the Forest Service.

Warch 21, 2007

Rick D. Cables

Regional Forester, Rocky Mountain Region

I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction into the Land and Resource Management Plans for the Ashley, Bridger-Teton, Targhee, and Salmon-Challis National Forests in the Intermountain Region of the Forest Service.

Jack G. Troyer

Regional Forester, Intermountain Region

I am the Responsible Official for incorporating the Northern Rockies Lynx Management Direction into the Land and Resource Management Plans for the Beaverhead-Deerlodge, Bitterroot, Clearwater, Custer, Flathead, Gallatin, Helena, Idaho Panhandle, Kootenai, Lewis & Clark, Lolo, and Nez Perce National Forests in the Northern Region of the Forest Service.

Kathlema Millister	March 23,	2007
Kathleen A. McAllister	Date	
Acting Regional Forester, Northern Region		

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# ATTACHMENT 1

# **Northern Rockies Lynx Management Direction**

The following management direction applies to all National Forest System lands that are known to be **occupied** by Canada lynx. At the time of this decision the following National Forests in the Northern Rockies lynx planning area are known to be occupied: Bridger-Teton, Clearwater, Custer, Flathead, Idaho Panhandle, Kootenai, Lolo, Shoshone, Targhee. Portions of the Custer, Gallatin, Helena, and Lewis & Clark are also occupied.

The following National Forests in the Northern Rockies lynx planning area are **not occupied** by Canada lynx: Ashley, Beaverhead-Deerlodge, Bighorn, Bitterroot, Nez Perce, Salmon-Challis. In addition, isolated mountain ranges on the Custer, Gallatin, Helena and Lewis and Clark are unoccupied – see Figure 1-1. Until such time as these National Forest System lands become occupied they should consider the following management direction, but are not required to follow it.

#### $GOAL^{14}$

Conserve the Canada lynx.

ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). The following objectives, standards, and guidelines apply to all management projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use.

# Objective<sup>30</sup> ALL O1

Maintain<sup>26</sup> or restore<sup>40</sup> lynx habitat<sup>23</sup> connectivity<sup>16</sup> in and between LAUs<sup>21</sup>, and in linkage areas<sup>22</sup>.

#### Standard<sup>44</sup> ALL S1

New or expanded permanent development<sup>33</sup> and vegetation management<sup>49</sup> projects<sup>36</sup> must maintain<sup>26</sup> habitat connectivity<sup>16</sup> in an LAU<sup>21</sup> and/or linkage area<sup>22</sup>.

# Guideline<sup>15</sup> ALL G1

Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways<sup>18</sup> or forest highways<sup>12</sup> across federal land. Methods could include fencing, underpasses, or overpasses.

# Standard<sup>44</sup> LAU S1

Changes in LAU<sup>21</sup> boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.

VEGETATION MANAGEMENT ACTIVITIES AND PRACTICES (VEG). The following objectives, standards, and guidelines apply to vegetation management projects<sup>36</sup> in lynx habitat within lynx analysis units (LAUs) in occupied habitat. With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads, and the like. None of the objectives, standards, or guidelines apply to linkage areas.

# Objective<sup>30</sup> VEG O1

Manage vegetation<sup>49</sup> to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.

# Objective VEG O2

Provide a mosaic of habitat conditions through time that support dense horizontal cover<sup>19</sup>, and high densities of snowshoe hare. Provide winter snowshoe hare habitat<sup>51</sup> in both the stand initiation structural stage and in mature, multi-story conifer vegetation.

# Objective VEG O3

Conduct fire use<sup>11</sup> activities to restore<sup>40</sup> ecological processes and maintain or improve lynx habitat.

# Objective VEG O4

Focus vegetation management<sup>49</sup> in areas that have potential to improve winter snowshoe hare habitat<sup>51</sup> but presently have poorly developed understories that lack dense horizontal cover.

## Standard<sup>44</sup> VEG S1

Where and to what this applies: Standard VEG S1 applies to all vegetation management<sup>49</sup> projects<sup>36</sup> that regenerate<sup>38</sup> forests, except for fuel treatment<sup>13</sup> projects<sup>36</sup> within the wildland urban interface<sup>50</sup> (WUI) as defined by HFRA<sup>17</sup>, subject to the following limitation:

Fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest). *In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard.* 

For fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> see guideline VEG G10.

**The standard:** Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages<sup>45</sup> limit disturbance in each LAU as follows:

If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects<sup>36</sup>.

#### Standard VEG S2

Where and to what this applies: Standard VEG S2 applies to all timber management<sup>47</sup> projects<sup>36</sup> that regenerate<sup>38</sup> forests, except for fuel treatment<sup>13</sup> projects<sup>36</sup> within the wildland urban interface<sup>50</sup> (WUI) as defined by HFRA<sup>17</sup>, subject to the following limitation:

Fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> see guideline VEG G10.

**The standard:** Timber management<sup>47</sup> projects<sup>36</sup> shall not regenerate<sup>38</sup> more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period.

#### Standard VEG S5

Where and to what this applies: Standard VEG S5 applies to all precommercial thinning<sup>35</sup> projects<sup>36</sup>, except for fuel treatment<sup>13</sup> projects<sup>36</sup> that use precommercial thinning as a tool within the wildland urban interface<sup>50</sup> (WUI) as defined by HFRA<sup>17</sup>, subject to the following limitation:

Fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> see guideline VEG G10.

**The Standard:** Precommercial thinning projects<sup>36</sup> that reduce snowshoe hare habitat may occur from the stand initiation structural stage<sup>45</sup> until the stands no longer provide winter snowshoe hare habitat only:

- 1. Within 200 feet of administrative sites, dwellings, or outbuildings; or
- 2. For research studies<sup>39</sup> or genetic tree tests evaluating genetically improved reforestation stock; or
- 3. Based on new information that is peer reviewed and accepted by the regional level of the Forest Service, and state level of FWS, where a written determination states:
  - a. that a project<sup>36</sup> is not likely to adversely affect lynx; or
  - b. that a project<sup>36</sup> is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat; or
- 4. For conifer removal in aspen, or daylight thinning<sup>5</sup> around individual aspen trees, where aspen is in decline; or

- 5. For daylight thinning of planted rust-resistant white pine where 80 % of the winter snowshoe hare habitat<sup>51</sup> is retained; or
- 6. To restore whitebark pine.

Exceptions 2 through 6 shall only be utilized in LAUs where Standard VEG S1 is met.

#### Standard VEG S6

Where and to what this applies: Standard VEG S6 applies to all vegetation management<sup>49</sup> projects<sup>36</sup> except for fuel treatment<sup>13</sup> projects<sup>36</sup> within the wildland urban interface<sup>50</sup> (WUI) as defined by HFRA<sup>17</sup>, subject to the following limitation:

Fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> that do not meet Standards VEG S1, VEG S2, VEG S5, and VEG S6 shall occur on no more than 6 percent (cumulatively) of lynx habitat on each administrative unit (a unit is a National Forest).

For fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> see guideline VEG G10.

**The Standard:** Vegetation management projects<sup>36</sup> that reduce snowshoe hare habitat in multi-story mature or late successional forests<sup>29</sup> may occur only:

- 1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or
- 2. For research studies<sup>39</sup> or genetic tree tests evaluating genetically improved reforestation stock; or
- 3. For incidental removal during salvage harvest<sup>42</sup> (e.g. removal due to location of skid trails).

Exceptions 2 and 3 shall only be utilized in LAUs where Standard VEG S1 is met. (NOTE: Timber harvest is allowed in areas that have potential to improve winter snowshoe hare habitat but presently have poorly developed understories that lack dense horizontal cover [e.g. uneven age management systems could be used to create openings where there is little understory so that new forage can grow]).

# Guideline VEG G1

Vegetation management<sup>49</sup> projects<sup>36</sup> should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available. Priority for treatment should be given to stem-exclusion, closed-canopy structural stage<sup>46</sup> stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat<sup>51</sup> should be near denning habitat<sup>6</sup>.

#### Guideline VEG G4

Prescribed fire<sup>34</sup> activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.

## Guideline VEG G5

Habitat for alternate prey species, primarily red squirrel<sup>37</sup>, should be provided in each LAU.

# Guideline VEG G10

Fuel treatment projects<sup>36</sup> within the WUI<sup>50</sup> as defined by HFRA<sup>17</sup> should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.

# Guideline VEG G11

Denning habitat<sup>6</sup> should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees ("jack-strawed" piles). If denning habitat appears to be lacking in the LAU, then projects<sup>36</sup> should be designed to retain some coarse woody debris<sup>4</sup>, piles, or residual trees to provide denning habitat<sup>6</sup> in the future.

LIVESTOCK MANAGEMENT (GRAZ): The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat. They do not apply to linkage areas.

# Objective<sup>30</sup> GRAZ O1

Manage livestock grazing to be compatible with improving or maintaining<sup>26</sup> lynx habitat<sup>23</sup>.

## Guideline<sup>15</sup> GRAZ G1

In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.

#### Guideline GRAZ G2

In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.

#### Guideline GRAZ G3

In riparian areas<sup>41</sup> and willow carrs<sup>3</sup>, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages<sup>28</sup>, similar to conditions that would have occurred under historic disturbance regimes.

#### Guideline GRAZ G4

In shrub-steppe habitats<sup>43</sup>, livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs<sup>21</sup>, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

HUMAN USE PROJETS (HU): The following objectives and guidelines apply to human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAUs) in occupied habitat, subject to valid existing rights. They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.

# Objective<sup>30</sup> HU O1

Maintain<sup>26</sup> the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat<sup>23</sup>.

# Objective HU O2

Manage recreational activities to maintain lynx habitat and connectivity<sup>16</sup>.

## Objective HU O3

Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.

# Objective HU O4

Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation<sup>9</sup> sites or ski areas.

#### Objective HU O5

Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.

# Objective HU O6

Reduce adverse highway<sup>18</sup> effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity<sup>16</sup>, and to reduce the potential of lynx mortality.

#### Guideline<sup>15</sup> HU G1

When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris<sup>4</sup>, so winter snowshoe hare habitat<sup>51</sup> is maintained.

#### Guideline HU G2

When developing or expanding ski areas, lynx foraging habitat should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.

#### Guideline HU G3

Recreation developments and operations should be planned in ways that both provide for lynx movement and maintain the effectiveness of lynx habitat<sup>23</sup>.

#### Guideline HU G4

For mineral and energy development sites and facilities, remote monitoring should be encouraged to reduce snow compaction.

## Guideline HU G5

For mineral and energy development sites and facilities that are closed, a reclamation plan that restores<sup>40</sup> lynx habitat should be developed.

# Guideline HU G6

Methods to avoid or reduce effects on lynx should be used in lynx habitat<sup>23</sup> when upgrading unpaved roads to maintenance levels 4 or 5, if the result would be increased traffic speeds and volumes, or a foreseeable contribution to increases in human activity or development.

#### Guideline HU G7

New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity<sup>16</sup>. New permanent roads and trails should be situated away from forested stringers.

## Guideline HU G8

Cutting brush along low-speed<sup>25</sup>, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.

#### Guideline HU G9

On new roads built for projects<sup>36</sup>, public motorized use should be restricted. Effective closures should be provided in road designs. When the project<sup>36</sup> is over, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

# Guideline HU G10

When developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security habitat<sup>10</sup>, if it has been identified as a need.

#### Guideline HU G11

Designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction<sup>1</sup>, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs.

This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.

Use the same analysis boundaries for all actions subject to this guideline.

#### Guideline HU G12

Winter access for non-recreation special uses and mineral and energy exploration and development, should be limited to designated routes<sup>8</sup> or designated over-the-snow routes<sup>7</sup>.

# LINKAGE AREAS (LINK): The following objective, standard, and guidelines apply to all projects within linkage areas in occupied habitat, subject to valid existing rights.

# Objective<sup>30</sup> LINK O1

In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat.

# Standard<sup>44</sup> LINK S1

When highway<sup>18</sup> or forest highway<sup>12</sup> construction or reconstruction is proposed in linkage areas<sup>22</sup>, identify potential highway crossings.

# Guideline<sup>15</sup> LINK G1

NFS lands should be retained in public ownership.

# Guideline LINK G2

Livestock grazing in shrub-steppe habitats<sup>43</sup> should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages<sup>28</sup>, similar to conditions that would have occurred under historic disturbance regimes.

## **REQUIRED MONITORING**

Map the location and intensity of snow compacting activities and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000. The mapping is to be completed within one year of this decision, and changes in activities and routes are to be monitored every five years after the decision.

When project decisions are signed report the following:

- 1. Fuel treatments:
  - a. Acres of fuel treatment in lynx habitat by forest and LAU, and whether the treatment is within *or outside* the WUI as defined by HFRA.
  - b. Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.
  - c. Whether or not 2 adjacent LAUs exceed standard VEG S1 (30% in a stand initiation structural stage that is too short to provide winter snowshoe hare habitat), and what event(s) or action(s) caused the standard to be exceeded.
- 2. Application of exception in Standard VEG S5
  - a. For areas where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied: Report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
- 3. Application of exceptions in Standard VEG S6
  - a. For areas where any of the exemptions 1 through 3 listed in Standard VEG S6 were applied: Report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
- 4. Application of guidelines
  - a. Document the rationale for deviations to guidelines. Summarize what guideline(s) was not followed and why.

Directions in italics were terms and conditions that were incorporated from the FWS Biological Opinion (USDI FWS 2007).

#### **GLOSSARY**

- <sup>1</sup> Area of consistent snow compaction An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall. These can be areas or linear routes, and are generally found in or near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the acreage or miles used during the period 1998 to 2000.
- <sup>2</sup> Broad scale assessment A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends, and a characterization of the ecological, social, and economic components of an area. (LCAS)
- <sup>3</sup> *Carr* Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)
- <sup>4</sup> Course woody debris Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)
- <sup>5</sup> Daylight thinning Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.
- <sup>6</sup> Denning habitat (lynx) Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens. Denning habitat must be within daily travel distance of winter snowshoe hare habitat the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.
- <sup>7</sup> Designated over-the-snow routes Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency. The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged during the period 1998 to 2000.
- <sup>8</sup> Designated route A designated route is a road or trail that has been identified as open for specified travel use.
- <sup>9</sup> *Developed recreation* Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings, and roads; campgrounds require roads, picnic tables, and toilet facilities.

- <sup>10</sup> Security habitat (lynx) Security habitat amounts to places in lynx habitat that provide secure winter bedding sites for lynx in highly disturbed landscapes like ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Forest structures that make human access difficult generally discourage human activity in security habitats. Security habitats are most effective if big enough to provide visual and acoustic insulation and to let lynx easily move away from any intrusion. They must be close to winter snowshoe hare habitat. (LCAS)
- <sup>11</sup> Fire use Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire management plan. The use of the term wildland fire use replaces the term prescribed natural fire. (Wildland and Prescribed Fire Management Policy, August 1998)
- <sup>12</sup> Forest highway A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the FS, state transportation agency, and Federal Highway Administration.
- <sup>13</sup> Fuel treatment A fuel treatment is a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire-adapted ecosystems.
- <sup>14</sup> Goal A goal is a broad description of what an agency is trying to achieve, found in a land management plan. (LCAS)
- <sup>15</sup> *Guideline* A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)
- <sup>16</sup> Habitat connectivity (lynx) Habitat connectivity consists of an adequate amount of vegetation cover arranged in a way that allows lynx to move around. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian areas may provide travel cover across open valley floors. (LCAS)
- <sup>17</sup> HFRA (Healthy Forests Restoration Act) Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. (Modified from Forest Service HFRA web site.)
- <sup>18</sup> Highway The word highway includes all roads that are part of the National Highway System. (23 CFR 470.107(b))
- <sup>19</sup> *Horizontal cover* Horizontal cover is the visual obscurity or cover provided by habitat structures that extend to the ground or snow surface primarily provided by tree stems

#### Northern Rockies Lynx Management Direction

and tree boughs, but also includes herbaceous vegetation, snow, and landscape topography.

- <sup>20</sup> Isolated mountain range Isolated mountain ranges are small mountains cut off from other mountains and surrounded by flatlands. On the east side of the Rockies, they are used for analysis instead of sub-basins. Examples are the Little Belts in Montana and the Bighorns in Wyoming.
- <sup>21</sup> LAU (Lynx Analysis Unit) An LAU is an area of at least the size used by an individual lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.
- <sup>22</sup> Linkage area A linkage area provides connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where basins, valleys, or agricultural lands separate blocks of lynx habitat, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)
- <sup>23</sup> Lynx habitat Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the northern Rockies, lynx habitat generally occurs between 3,500 and 8,000 feet of elevation, and primarily consists of lodgepole pine, subalpine fir, and Engelmann spruce. It may consist of cedar-hemlock in extreme northern Idaho, northeastern Washington and northwestern Montana, or of Douglas-fir on moist sites at higher elevations in central Idaho. It may also consist of cool, moist Douglas-fir, grand fir, western larch and aspen when interspersed in subalpine forests. Dry forests do not provide lynx habitat. (LCAS)
- <sup>24</sup> Lynx habitat in an unsuitable condition –Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)
- <sup>25</sup> Low-speed, low-traffic-volume road Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.
- <sup>26</sup> *Maintain* In the context of this decision, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.
- <sup>27</sup> Maintenance level Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3) Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads have double lanes and an aggregate surface. Some may be single lane; some may be paved or have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience.

- Normally, level 5 roads are have double lanes and are paved, but some may be aggregate surfaced with the dust abated.
- <sup>28</sup> *Mid-seral or later* Mid-seral is the successional stage in a plant community that is the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.
- <sup>29</sup> *Multi-story mature or late successional forest* This stage is similar to the *old multistory structural* stage (see below). However, trees are generally not as old, and decaying trees may be somewhat less abundant.
- <sup>30</sup> Objective An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)
- <sup>31</sup> Old multistory structural stage Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)
- <sup>32</sup> Old growth Old growth forests generally contain trees that are large for their species and the site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags, and logs, and a developed and often patchy understory.
- <sup>33</sup> *Permanent development* A permanent development is any development that results in a loss of lynx habitat for at least 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds, and many special use developments would be considered permanent developments.
- <sup>34</sup> Prescribed fire A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term prescribed fire replaces the term management ignited prescribed fire. (NWCG)
- <sup>35</sup> Precommercial thinning Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return. (Dictionary of Forestry)
- <sup>36</sup> Project All, or any part or number of the various activities analyzed in an Environmental Impact Statement, Environmental Analysis, or Decision Memo. For example, the vegetation management in some units or stands analyzed in an EIS could be for fuel reduction, and therefore those units or stands would fall within the term *fuel treatment project* even if the remainder of the activities in the EIS are being conducted for other purposes, and the remainder of those units or stands have other activities prescribed in them. All units in an analysis do not necessarily need to be for fuel reduction purposes for certain units to be considered a *fuel reduction project*.

- <sup>37</sup> Red squirrel habitat Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.
- <sup>38</sup> Regeneration harvest The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts. (Helms, 1998)
- <sup>39</sup> Research Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the NF budget.
- <sup>40</sup> *Restore, restoration* To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)
- <sup>41</sup> Riparian area An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. (LCAS)
- <sup>42</sup> Salvage harvest Salvage harvest is a commercial timber sale of dead, damaged, or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.
- <sup>43</sup> *Shrub steppe habitat* Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.
- <sup>44</sup> Standard A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.
- <sup>45</sup> Stand initiation structural stage The stand initiation stage generally develops after a stand-replacing disturbance by fire or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site. Trees that need full sun are likely to dominate these even-aged stands. (Oliver and Larson, 1996)
- <sup>46</sup> Stem exclusion structural stage (Closed canopy structural stage) In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture. (Oliver and Larson, 1996)
- <sup>47</sup> *Timber management* Timber management consists of growing, tending, commercially harvesting, and regenerating crops of trees.
- <sup>48</sup> Understory re-initiation structural stage In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed, or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A

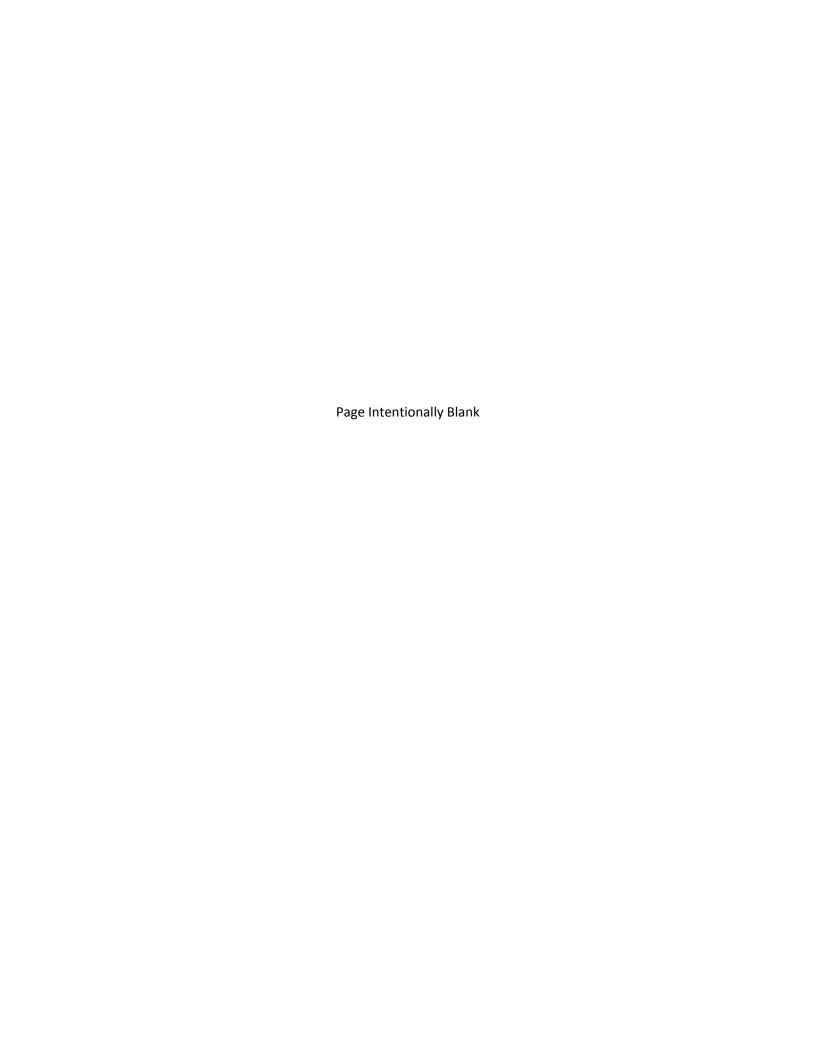
#### Northern Rockies Lynx Management Direction

low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory. (Oliver and Larson, 1996)

- <sup>49</sup> Vegetation management Vegetation management changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this decision, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.

  <sup>50</sup> Wildland urban interface (WUI) Use the definition of WUI found in the Healthy Forests Restoration Act. The full text can be found at HFRA § 101. Basically, the wildland urban interface is the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe
- <sup>51</sup> Winter snowshoe hare habitat Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely thousands of woody stems per acre and tall enough to protrude above the snow during winter, so snowshoe hare can browse on the bark and small twigs (LCAS). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stages.

evacuations. (Condensed from HFRA. For full text see HFRA § 101.)



# **Appendix G: Crosswalk of Relevant Plan Components** for Selected Species, Drivers, and Stressors

# **Table of Contents**

IntroductionCrosswalks	
List of Tables	
Table G-1. Crosswalk of species/key plan components	G-1
Table G-2. Drivers and stressors of aquatic ecosystems and species	
Table G-3. Drivers and stressors of terrestrial ecosystems and species	

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G-ii Appendix G: Crosswalk

# Introduction

The 2012 planning rule direction is for integrated plan components that "together provide for sustainability, ecological integrity, diversity of plan and animal communities, ecosystem services, and multiple use" (Forest Service Handbook 1909.12). Due to the integrated nature of the draft plan, a number of topics are addressed by plan components throughout sections of the plan. The following crosswalks will assist users in locating direction relevant to aquatic, terrestrial, plant, and animal species, and ecosystem drivers and stressors.

# **Crosswalks**

The Forest adopted an ecosystem and species-specific approach, known as a coarse-filter/fine-filter approach, to provide for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. The coarse-filter plan components are designed to maintain or restore ecological conditions for ecosystem integrity and ecosystem diversity in the plan area within Agency authority and the inherent capability of the land. Plan components found in the "Terrestrial Ecosystem and Vegetation" and "Aquatic Ecosystem" sections address most needs of animal and plant species. Fine-filter plan components are designed to provide for additional specific habitat needs, when those needs are not met through the coarse-filter plan components. The list of plan components in table G-1 is not an entire list, but is a list of the key plan components (desired conditions (DC), standards (STD), and guidelines (GDL) contributing to the long-term persistence of species on the Flathead National Forest. Plan components may apply at the forestwide scale (FW), the geographic area scale (GA), or the management area (MA) scale.

Table G-1. Crosswalk of species/key plan components

Species	Key Plan Components, and Biophysical Setting (as needed) that Address the Species
Grizzly bear	FW-DC-WL-01, 02; FW-STD-WL-01, 02; FW-GDL-WL-01, 02, 03; FW-STD-IFS-01, 02, 03. 04; FW-GDL-IFS-01, 02; FW-DC-REC-01, 02; FW-STD-REC-01, 02; FW-GDL-REC-01; FW-DC-TE&V-19, GA-SM-GDL-01, 02; GA-SM-STD-01, FW-DC-TE&V-01, 02; FW-DC-TE&V-19 all biophysical settings, FW-STD-TE&V-01, FW-GDL-TE&V-01, 02, 03, 04, 05; FW-STD-RMZ-01, 02; FW-DC-GR-01, FW-STD-GR-01, 02, 03, 04, 05, 06; FW-GDL-GR-01, 02; FW-DC-ECOS OFP-01, FW-STD-OFP-01, FW-STD-E&M-01, 02, 03, 04, 05, 06; GA-SM-MA7-Big Mtn-DC-04, GA-SM-MA7-Big Mtn GDL-01
Canada lynx	Refer to Appendix F; FW-DC-WL-03, FW-GDL-REC-05, FW-DC-TE&V-19, FW-STD-TE&V-03
Whitebark pine	FW-DC-PLANT-02, FW-OBJ-PLANT-01, FW-GDL-PLANT-01, FW-GDL-TE&V-01, FS-OBJ-TE&V-01, FW-DC-TE&V-19 cold, FW-STD-TE&V-03, Appendix F VEG S5, VEG S6
Water howellia	FW-DC-PLANT-01, FW-STD-PLANT-01, FW-GDL-PLANT-01, 02; GA-SV-DC-01,03; MA3b-Special Area-DC-04

G-1 Appendix G: Crosswalk

Species	Key Plan Components, and Biophysical Setting (as needed) that Address the Species	
SCC plant species	In addition to all Plan Components in the section "Plants currently designated species of conservation concern":  a. Peatland group: FW-DC-WTR-10, 15; FW-DC-WL SOI-01; GA-SV-DC-08; All plan components in the section MA3b-Special Areas.  b. Wetlands/Riparian group (in addition to those associated with peatlands	
	<ul> <li>above): FW-DC-RMZ-01, 03; FW-STD-RMZ-01, 02, 03, 06; FW-GDL-RMZ-02; FW-GDL-E&amp;M-08, 09, 10; FW-STD-IFS-02, FW-GDL-IFS-02, FW-GDL-CNW-01, FW-DC-WL SOI-02, 03; FW-GDL-WL SOI-05, FW-DC-WTR-02, 03, 11, 12.</li> <li>c. Mesic/Rockland/Disturbance group: FW-STD-SOIL-01; FW-DC-TE&amp;V-04, 05, 22, 24.</li> </ul>	
Terrestrial invertebrate species	FW-DC-POLL-01, FW-GDL-POLL-01, GA-SV-DC-12, GA-SV-GDL-03, FW-DC-TE&V-04, 05	
Clark's nutcracker (species of conservation concern (SCC))	FW-WL SCC-01, FW-DC-PLANT-02, FW-OBJ-PLANT-01, FW-GDL-PLANT-01, FW-GDL-TE&V-01, FS-OBJ-TE&V-01, FW-DC-TE&V-19 cold	
Big game species	FW-DC-TE&V-19, FW-GDL-WL SOI-01, 04; FW-DC-TE&V-09, 10; FW-GDL-TIMB-05, FW-GDL-NNIP-01, FW-OBJ-NNIP-01; GA-HH-DC-02, GA-NF-DC-11, GA-SV-DC-05, GA-SM-DC-05, GA-NF-GDL-01, GA-SF-GDL-01, GA-SV-GDL-02, GA-SM-GDL-01, GA-SM-STD-01	
Gray wolf	FW-DC-TE&V-19, FW-GDL-WL SOI-04 (also refer to big game species)	
Hardwood trees	FW-DC-WL SOI-03, 04; FW-DC-TE&V-10, FW-OBJ-TE&V-03, FW-STD-GR-04, 08; GA-SV-GDL-06	
Most Wildlife Species Associated with Snags and Burned Forest	FW-GDL-TIMB-02, 03, 04; FW-DC-TE&V-16, 17, 18; FW-STD-TE&V-04	
Flammulated owl (SCC)	FW-DC-WL SCC-01; FW-DC-TE&V-19 warm-dry and warm-moist	
Black-backed woodpecker	FW-DC-TE&V-19, FW-GDL-TIMB-03	
Most Wildlife Species Associated with Old Growth, Late Successional, Very Large Trees	FW-DC-TE&V-11, 12, 13, 15, 16, 17, 18; FW-STD-TE&V-02, 04	
Fisher (SCC)	FW-DC-WL SCC-03, FW-STD-RMZ-01, 02, 03, 04; FW-DC-TE&V-19 warm-moist and RMZs in cool-moist, FW-STD-TE&V-02, 04; FW-GDL-TE&V-06 thru 11	
Most Wildlife Species Associated with Cliffs, Rock, Caves	FW-DC-WL SOI-01, FW-GDL-E&M-06	
Mountain goat	FW-DC-WL SOI-01, FW-GDL-WL SOI-04, 06	
Townsend's big-eared bat (SCC)	FW-DC-WL SCC-01; FW-GDL-WL SCC-01, 02	
Peregrine falcon	FW-GDL-WL SOI-04	
Wolverine	FW-GDL-REC-05, FW-GDL-WL SOI-04, 06	
Most Wildlife Species Associated with Aquatic, Wetland and Riparian Ecosystems	FW-STD-RMZ-01, 02; FW-GDL-E&M-07, 08; FW-STD-IFS-02, FW-GDL-IFS-02, FW-GDL-RMZ-03, FW-GDL-CNW-01, FW-DC-WL SOI-02, 03; FW-GDL-WL SOI-05, FW-DC-WTR-01, 03, 10 thru 18; FW-GDL-WTR-02, 03, 04, 07, 10, 11	
Aquatic species	Refer to "Most Species Associated with Aquatic, Wetland and Riparian Ecosystems" section	
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Black swift (SCC)	FW-DC-WL SCC-01, FW-GDL-WL-04	

G-2 Appendix G: Crosswalk

Species	Key Plan Components, and Biophysical Setting (as needed) that Address the Species
Northern bog lemming	FW-DC-WTR-10, 11, 13 thru 15; FW-DC-RMZ-01, 03; FW-DC-WL SCC-01; FW-STD-RMZ-01, 02; MA3b-Special Area-DC-0; MA3b-Special Area-GDL-01; MA3b-Special area-SUIT-01, 02
Common Ioon	FW-GDL-WL SOI-03, 04; FW-OBJ-WL SOI-01
Beaver	FW-DC-WTR-15, FW-GDL-WTR-07, FW-DC-TE&V-10, FW-OBJ-TE&V-03
Boreal toad	FW-DC-WTR-01 thru 03, 10 thru 18; FW-GDL-WTR-07, 10, 11; FW-GDL-RMZ-02, FW-GDL-NNIP-01, FW-OBJ-NNIP-01, FW-GDL-TE&V-10
Bald eagle	FW-DC-WL SOI-01, 03; FW-GDL-WL SOI-02, 04; FW-GDL-TE&V-12, FW-DC-TE&V-10
Great blue heron	FW-GDL-WL SOI-04, FW-DC-TE&V-10, FW-STD-TE&V-04
Wildlife Connectivity	See appendix F: ALL 01, ALL S1, ALL G1, LINK 01, LINK S1, LINK G1, G2 FW-DC-WTR-02, FW-STD-RMZ-01,02, 03, 04; FW-DC-TE&V-15, FW-DC-TE&V-19, FW-STD-TE&V-02, 04; FW-GDL-TE&V-06 thru 11; FW-DC-WL SCC-01, FW-DC-WL SOI-01, 02, 05; FW-DC-LSU-01, FW-GDL-E&M-03, FW-DC-P&C-01, 14, MA6 a, b, c DC-02, GA-HH-DC-02, GA-MF-DC-06, GA-NF-DC-07, 08; GA-SM-DC-03, 08 (alt. C), GA-SV-DC-09, FW-GDL-IFS-13

One of the goals of the revised plan is to maintain or restore ecological integrity, which is defined as: the quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence (36 CFR 219.19).

Drivers and stressors are factors that may directly or indirectly affect ecological integrity. The Flathead National Forest considered conditions, trends, drivers and stressors identified in the *Assessment of the Flathead National Forest*<sup>1</sup> related to the need to change the plan components (§ 219.6). Tables G-2 and G-3 provide crosswalks of the primary plan components that would address those drivers or stressors. The list of plan components in table G-2 is not an entire list, but is a list of the key plan components (desired conditions (DC), standards (STD), guidelines (GDL) and suitability. Plan components may apply at the forestwide scale (FW), the geographic area scale (GA), or the management area (MA) scale.

Table G-2. Drivers and stressors of aquatic ecosystems and species

Primary Drivers and Stressors	Potential Effects to All Aquatic Species	Plan Components Addressing Driver or Stressor
Climate Changes	Climate change may result in a warming climate that elevates water temperatures, changes the timing of rain events and spring run-off, and alters flow regimes. Elevated temperatures favor non-native rainbow and brook trout. Drought plays a critical role in that sediments are not flushed from stream systems. Low flows can cause an armoring of the streambed and make it difficult for redd construction or fry emergence for salmonids. Climate changes can cause fluctuations in groundwater.	FW-DC-WTR-08 thru 10, 13 thru 15
Fire and Fire Control	Fire has variable effects on aquatic resources. Fire may increase water temperatures, if riparian areas burn severely, and may deposit large amounts of sediment to streams	FW-DC-FIRE-01, 03, 04, 05 FW-STD-FIRE-01

<sup>&</sup>lt;sup>1</sup> USDA, Forest Service. 2014. *Assessment of the Flathead National Forest*. Available online at www.fs.usda.gov/goto/flathead/fpr.

G-3 Appendix G: Crosswalk

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Primary Drivers and Stressors	Potential Effects to All Aquatic Species	Plan Components Addressing Driver or Stressor
	through erosion. Conversely, fires can be beneficial and increase nutrients in nutrient-poor aquatic environments and provide large amounts of woody material to streams.	FW-GDL-RMZ-03, 04, 05, 07
Flooding	Regular flooding can be beneficial by reclaiming floodplains and establishing new vegetation, but some streams on the Flathead National Forest are still recovering from the 1964 flood. Flooding can scour and simplify stream habitats at extremes.	FW-DC-WTR-09 FW-STD-RMZ-01 FW-GDL-RMZ-02
Forest Insects and Disease	In general, insect and disease outbreaks are beneficial for aquatic environments by providing dead trees that are recruited to the stream network. If epidemic levels of insects or disease kill trees in riparian areas, it could lead to high intensity, high severity fires that could have detrimental effects to aquatic species, for example, by reducing stream shading.	FW-GDL-WTR-03
Human Developments	Human developments such as primary road networks can have negative effects on aquatic habitats. Culvert barriers and elevated sediment levels restrain fish populations. Dams also fall into this category and create barriers for fish passage. However, the barriers dams create can have beneficial effects, for example by preventing upstream migration of non-native species (e.g., lake trout and Hungry Horse dam).	FW-DC-WTR-01 thru 07, 11 FW-STD-WTR-01 thru 03 FW-GDL-WTR-01 thru 08 FW-OBJ-WTR-01 thru 04 FW-DC-CNW-01 FW-OBJ-CNW-01, 02 FW-GDL-CNW-01 FW-GDL-RMZ-02 FW-DC-IFS-05, 14, 15 FW-OBJ-IFS-01 FW-STD-IFS-02, 05 thru 07 FW-GDL-IFS-02 thru 11, 13 FW-GDL-LSU-02, 03, 04 FW-DC-WL SOI-04 FW-GDL-WL SOI-04 FW-GDL-WL SOI-02 thru 04 FW-OBJ-WL SOI-01
Contaminants	Chemical contaminants can build up in aquatic environments. Chemicals may affect aquatic species or the food supply of terrestrial wildlife species.	FW-DC-WTR-06 FW-STD-WTR-04 FW-STD-RMZ-06 FW-GDL-RMZ-03 FW-GDL-NNIP-01 FW-STD-IFS-05
Invasive Species	Invasive species are perhaps the single greatest threat to aquatic resources. Non-native lake trout in Swan and Flathead lakes have impacted native fish populations, rainbow trout have hybridized with pure cutthroat populations and brook trout have outcompeted and hybridized with native fish populations. Invasion by New Zealand mud snails and quagga mussels are potential threats.	FW-DC-WTR-12, 18 FW-GDL-WTR-04, 09 thru 11

G-4 Appendix G: Crosswalk

Primary Drivers and Stressors	Potential Effects to All Aquatic Species	Plan Components Addressing Driver or Stressor
Vegetation Treatments	Vegetation treatments themselves have had little effects on aquatic habitats; historically elevated water yields led to inchannel erosion but this effect is rarely seen today on the Forest's watersheds. The associated road networks that support the treatments tend to have more of an effect (see Human Land Uses and Development, above).	FW-DC-RMZ-01, 02, 03 FW-OBJ-RMZ-01 FW-STD-RMZ-02, 03, 04 FW-GDL-RMZ-01, 09 FW-DC-WL SOI-02, 03 FW-GDL-WL SCC-03
Cattle Grazing	Grazing can cause long-term negative effects to aquatic habitats through bank trampling and reduction of streamside vegetation.	FW-STD-GR-07, 08 FW-GDL-GR-03, 04, 05

Table G-3. Drivers and stressors of terrestrial ecosystems and species

Primary Drivers and Stressors	Potential Effects to Wildlife Threatened and Endangered, Species of Conservation Concern, and Species of Public Interest	Plan Components Addressing Driver or Stressor
Climate Change- Snowpack	Climate change may alter the location of areas providing deep, fluffy snow or result in reduced acreage with persistent spring snow or result in earlier snowmelt in areas providing habitat for associated species such as the wolverine, White-tailed Ptarmigan, Grey-crowned Rosyfinch, pika and hoary marmot. There is a high level of uncertainty associated with expected winter changes to climate in northwest Montana. Human activities with a potential to disturb some wildlife species may occur in areas of persistent spring snow.	FW-GDL-WL SOI-06 FW-DC-REC-20 FW-GDL-REC-04 FW-DC-TIMB-05
Climate Change– Drought	Black swifts nest behind waterfalls. Waterfalls may dry up sooner, or altogether, if the frequency or severity of droughts increases, reducing available nesting habitat. Boreal toads breed in ponds and shallow lake margins. Ponds may dry up sooner, or altogether, if the frequency or severity of droughts increases, reducing available breeding habitat. Changes in water levels may result in loss of peatlands, reducing habitat or habitat connectivity for associated species such as the Northern bog lemming.	FW-DC-WTR-08,10,13 FW-DC-WL SCC-01 MA 3b FW-DC-WTR-10, 15 FW-GDL-PLANT SCC-02
Climate Change– Avalanches	Avalanches are a natural ecosystem process. They may increase or decrease with changes in climate. There is a high level of uncertainty associated with expected winter changes to climate in northwest Montana. Avalanche chutes provide food and cover for species such as the grizzly bear throughout the non-denning season. Wolverines may feed on carcasses of animals found in avalanche chutes. Most avalanche areas are found in wilderness or proposed wilderness areas where natural ecosystem processes prevail.	MA-1a-DC-02 MA-1b-DC-02
Climate Change– Wildfires	Climate change may result in increased acreage and/or severity of wildfires. Moose, elk, black-backed woodpecker, olive-sided flycatcher, Cassin's finch, hawk owl and other species associated with burned habitats or earlier successional forest may benefit from increases in wildfires.  Fisher, Canada lynx, marten and other species associated with forest cover may have reductions in available habitat and/or habitat connectivity for a period of 20 years or more until forested stands recover. Wildfire may also result in loss of forests meeting old growth criteria, but can create	FW-DC-TE&V-09, 16, 19, 22, 24 FW-GDL-TE&V-07 FW-DC-FIRE-03, 04 FW-GDL-FIRE-02 FW-DC-TIMB-06 FW-GDL-TIMB-02, 03, 04 MA1a-DC-02 MA1b-DC-02

G-5 Appendix G: Crosswalk

Primary Drivers and Stressors	Potential Effects to Wildlife Threatened and Endangered, Species of Conservation Concern, and Species of Public Interest	Plan Components Addressing Driver or Stressor
	very large snags and increase recruitment of down woody material.	MA4a-DC-01 MA5-DC-01
Climate Change— Changes in Streamflow or Frequency or Severity of Floods	Regular flooding may be beneficial by creating riparian habitats, reclaiming floodplains, promoting regeneration of cottonwood trees, establishing new shrubs, and providing habitat for wildlife species. Removal of beavers may cause reductions in the quantity or quality of riparian, wetland, or aquatic habitats. Beavers play a role in controlling flood waters. However, if flooding becomes extreme, more frequent, or occurs later in the spring, it may have detrimental effects on riparian wildlife species by causing higher levels of nest failure.	FW-DC-WTR-09 FW-GDL-RMZ-02 FW-STD-RMZ-01 FW-DC-TE&V-10 FW-GDL-WTR-08
Forest Insects and Disease	Some insects and diseases are part of natural ecosystem processes, but others are introduced. Infestations may become more extreme during drought conditions associated with changes in climate, resulting in economic and ecological losses. Forest diversity has been reduced by an introduced disease that kills whitebark pine and white pine trees. The loss of cone-producing whitebark pine trees has reduced the summer food supply for Clark's nutcrackers. Epidemic levels of insect or disease may result in loss of old growth stand structure needed by associated species. Spruce budworm may kill small spruce and sub-alpine fir trees, reducing understory tree density in lynx habitat. Cavity nesting species benefit by insects and diseases that create snags suitable for nesting and feeding.	FW-DC-TE&V-20, 21, 22, 23 FW-DC-TIMB-02, 05, 06 FW-GDL-TIMB-01 MA-1a-DC-02 MA-1b-DC-02 MA4a-DC-01
Terrestrial Invasive Species	Invasive plant species may out-compete native forage plants, but most wildlife species do not eat invasive plants. Warmer temperatures, associated drier conditions, and more severe or frequent droughts, may provide more opportunities for invasive plants to gain an advantage over native species, as invasive species are well adapted to using resources and reproducing quickly. Species with the greatest potential to be affected by invasive plants are those associated with grass-forb-shrub communities.	FW-OBJ-TE&V-04 FW-DC-NNIP-01, 02, 03 FW-OBJ-NNIP-01 MA1a-DC-04 MA3b-Special Area-DC
Human Land Uses– Vegetation Treatments	Forest succession moves forests from early to late successional stages, changing the forest composition, structure, and pattern over long periods of time. Vegetation treatments (e.g., timber harvest, pre-commercial thinning, fuels reduction, prescribed fire, and planting) alter forest composition, structure, processes, and patterns. Treatments may have beneficial, benign, or detrimental effects depending upon the animal species and whether or not treatments are moving forests towards desired ecosystem conditions.	See Aquatics section, table G-2, above See appendix C: Vegetation Management Activities and Practices FW-DC-TE&V-01 thru 19, 20, 24 FW-OBJ-TE&V-01, 03, 04 FW-STD-TE&V-01 thru 04 FW-GDL-TE&V-01 thru 12 FW-DC-FIRE-03, 04 FW-GDL-FIRE-02
Human Land Uses and Development– Open Road Network	Open roads may result in seasonal loss of habitat security for species sensitive to human activities (e.g., grizzly bears, black bears, gray wolves, mule deer, white-tailed deer, elk, and moose). Species associated with snags and	See appendix F: Human Use Projects FW-STD-SOIL-03, 04 FW-GDL-TE&V-01, 08

G-6 Appendix G: Crosswalk

Primary Drivers and Stressors	Potential Effects to Wildlife Threatened and Endangered, Species of Conservation Concern, and Species of Public Interest	Plan Components Addressing Driver or Stressor
and Motorized Over- snow Use	down logs (e.g., pileated woodpecker, bald eagle, flammulated owl, marten, and fisher) may lose large snags or down logs used for cavity-nesting or denning in areas with open roads.	FW-GDL-PLANT-02 FW-DC-SREC-02, 03, 04 FW-DC-WREC-02, 03 FW-DC-REC-18, 19, 20 FW-GDL-REC-05 FW-STD-REC-03, 05 FW-DC-IFS-01, 05, 11, 13 FW-OBJ-IFS-01 FW-STD-IFS-02, 04, 05 FW-GDL-IFS-01, 02, 08 FW-GDL-ISU-02 MA1a-SUIT-01 MA1b-STD-02 MA1b-SUIT-01 MA3b-Special Area-GDL-01 MA3b-Special area-SUIT-03, 04 MA5-SUIT-02 thru 06 MA6 a, b, c SUIT-02 GA-HH-DC-04 GA-MF-DC-03 GA-NF-DC-09 GA-SW-DC-01 GA-SM-GDL-01 GA-SM-GDL-01 GA-SM-MA7-SUIT-04
Human Land Uses and Development– Cities, Towns, Developments, and Broad Expanses of Unforested Land	High-use human developments such as cities, towns, and broad expanses of un-forested lands may reduce habitat connectivity for wildlife species such as the Canada lynx, wolverine, marten or fisher. High-traffic highways and associated human developments may result in increased mortality of some wildlife species (e.g., grizzly bear). Birds such as bald eagles may be killed by ingesting poisons or lead shot used to control ground squirrels or other predators.	See appendix F: Linkage Areas; All management practices and activities FW-DC-LSU-01 GA-HH-DC-04 GA-MF-DC-03 GA-NF-DC-02 GA-SV-DC-09 GA-SM-DC-01
Terrestrial Human Uses-Recreation, Special Uses, Energy and Minerals	Sites with high levels of human use may result in wildlife disturbance or other conflicts between people and wildlife	See appendix F: Human Use Projects FW-DC-REC-01, 02, 16 FW-STD-REC-01, 02, 04 FW-DC-WL-01, 05 FW-STD-WL-02 FW-GDL-WL-01, 02 FW-GDL-WL SCC-01, 02, 04 FW-GDL-WL SOI-02, 03, 04, 06

G-7 Appendix G: Crosswalk

Primary Drivers and Stressors	Potential Effects to Wildlife Threatened and Endangered, Species of Conservation Concern, and Species of Public Interest	Plan Components Addressing Driver or Stressor
		FW-STD-E&M-05 through 08 FW-GDL-ECOS E&M-03, 04 FW-STD-ECOS E&M-01 through 07
Human Land Uses– Caves, Old Mines and Buildings; Bridges	Townsend's big-eared bats use caves as maternity roosts and hibernacula. Recreational caving may introduce diseases such as white-nose syndrome. Closure of caves, old mines or buildings, or removal of bridges used by bats, can make breeding, over-wintering and/or roosting habitat less available to bats.	FW-DC-WL SCC-01 FW-GDL-WL SCC-01, 02
Human Uses-Hunting and Trapping	Populations of species such as moose, elk, deer, mountain goat, gray wolf, beaver, marten, fisher, and wolverine may be affected by hunting or trapping.	These activities are regulated by Montana Fish, Wildlife and Parks.
Human Uses-Cattle	Carcasses of grazing animals may become bear attractants. Grazing in riparian areas may decrease habitat quality if not managed properly. See table G-2 which also applies to aquatic and riparian wildlife species.	See appendix F: Livestock Management FW-DC-S&E-01 FW-DC-GR-01, 02 FW-GDL-GR-03 FW-STD-GR-01 through 06 FW-GDL-ECOS GR-01 through 04
Human Attractants– Food, Garbage	Human food and garbage may attract grizzly bears and other wildlife species, resulting in conflicts.	FW-DC-REC-06 FW-OBJ-REC-02 FW-STD-OFP-01 FW-DC-WL-01, 05 FW-STD-WL-02 FW-GDL-WL-01, 02, 03 FW-STD-E&M-04, 05

G-8 Appendix G: Crosswalk